14

Simpósio Internacional sobre Esquistossomose

International Symposium on Schistosomiasis

Salvador, Brazil

August 9 -11, 2015

www.bahia.fiocruz.br/schisto2015

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CONVITE

É com imenso prazer que convidamos para o 14º Simpósio Internacional de Esquistossomose, que se realizará em Salvador, Bahia, Brasil de 09 a 11 de agosto de 2015, no Bahia Othon Palace Hotel.

Esperamos cerca de 300 pessoas para apresentar e discutir os mais variados aspectos da esquistossomose, desde o ensino, passando pela pesquisa de aspectos importantes da doença, até a assistência. A maior característica do nosso simpósio será integrar os mais variados profissionais que atuam nesta área. Serão de todos os cantos do Brasil e também do mundo, o que contribuirá para aumentar seus conhecimentos e poderá ser uma oportunidade ímpar para você apresentar suas ideias e resultados.

Aproveite as belezas, a hospitalidade e o clima de Salvador, para ganhar energias e exercer com melhor desempenho suas atividades, desde as científicas, até as de simplesmente descansar, dançar ou praticar esportes, até os radicais, aproveitando o mar, o vento, as trilhas da nossa região. Portanto, uma a ciência à qualidade de vida estando presente ao nosso Evento.

INVITATION

It is with great pleasure to invite you to the 14th International Symposium on Schistosomiasis, to be held in Salvador, Bahia, Brazil between 09 to 11th August 2015, at the Bahia Othon Palace Hotel.

We are expecting about 300 registered participants to be present and discuss key aspects of Schistosomiasis from education, through basic and clinical research, to actions of public health officials. The most important aspect of the symposium will be the interdisciplinary integration, interaction and camaraderie of all kinds of professionals working in this area. Professionals and students will come from every corner of Brazil and the world, to help to increase their knowledge, see hear and speak with each other and maybe find unique opportunities to present results and develop ideas. The Symposium will be what we make it.

Enjoy the beauty, the hospitality and the atmosphere of Salvador, to regain energies, rethink directions, improve performance and simply relax.

Presidente do 14º Simpósio Internacional de Esquistossomose
***President of the 14th International Symposium on Schistos*omiasis**
Mitermayer Galvão dos Reis

Presidente do Comitê Científico
President of the Scientific Committee
Ricardo Riccio Oliveira

Presidente do Simpósio / *Symposium President*
Mitermayer Galvão dos Reis – CPqGM/Fiocruz

Presidente do Comitê Científico / *President of the Scientific Committee*
Ricardo Riccio Oliveira – CPqGM/Fiocruz

Comissão Científica do Simpósio / *Scientific Committee of Symposium*
Eliana Almeida Gomes Reis – CPqGM/Fiocruz
Mitermayer Galvão dos Reis – CPqGM/Fiocruz
Luciano Kalabric Silva – CPqGM/Fiocruz
Lúcio Macedo Barbosa – CPqGM/Fiocruz
Ricardo Riccio Oliveira – CPqGM/Fiocruz
Ronald Blanton – Universidade Case Western
Theomira Mauadie de Azevedo Carmo – CPqGM/Fiocruz

Coordenador Geral do Programa Institucional de Esquistossomose da FIOCRUZ / *General Coordinator of the Institutional Program of Schistosomiasis FIOCRUZ*
Tereza Cristina Favre - IOC/Fiocruz

Vice-Coordenador do Programa Institucional de Esquistossomose da FIOCRUZ / *Vice-Coordinator of the Institutional Program of Schistosomiasis FIOCRUZ*
Guilherme Corrêa de Oliveira - CPqRR/Fiocruz

Secretária do Programa Institucional de Esquistossomose da FIOCRUZ / *Secretary of the Institutional Program of Schistosomiasis FIOCRUZ*
Lilian Beck - IOC/Fiocruz

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Mitermayer Galvão dos Reis - CPqGM/Fiocruz
Otávio Sarmento Pieri - IOC/Fiocruz
Omar dos Santos Carvalho – CPqRR/Fiocruz

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Carlos Eduardo Grault – ENSP/Fiocruz
Naftale Katz – CPqRR/Fiocruz
Paulo Zech Coelho – CPqRR/Fiocruz
Ricardo Riccio Oliveira – CPqGM/Fiocruz
Rodrigo Corrêa de Oliveira – CPqRR/Fiocruz
Sheila Andrade de Oliveira – CPqAM/Fiocruz
Silvana Aparecida Carvalho Thiengo - IOC/Fiocruz
Silvia Maria Lucena Montenegro – CPqAM/Fiocruz
Zilton de Andrade – CPqGM/Fiocruz

Comitê Assessor Externo do Programa Institucional de Esquistossomose da FIOCRUZ / *External Advisory Committee of the Institutional Program of Schistosomiasis FIOCRUZ*
Ana Lúcia Domingues Coutinho - UFPE/Recife
Carlos Graeff Teixeira – PUC/Porto Alegre
Jeann Marie da Rocha Marcelino – Responsável Técnica pelo Programa Esquistossomose - SVS/Ministério da Saúde
José Roberto Machado e Silva – UERJ

PALESTRANTES / *SPEAKERS*

Afzal Ahmed Siddiqui
Akira Homma
Alain Dessein
Alceu de Castro Galvão Junior
Amaya Bustinduy
Ana Lúcia Coutinho Domingues
Andréa Gazzinelli
Antônio Andrade Filho
Carlos Graeff Teixeira
Carlos Eduardo Grault
Charles Harding King
Constança Clara Gayoso Simões Barbosa
Cristiane Lafeta Furtado de Mendonça
Cristiano Lara Massara
Cristina Toscano Fonseca
Daniel George Colley
Daniel Lacerda de Oliveira
David Rollinson
Donald Harn
Elainne Christine de Souza Gomes
Eliana Almeida Gomes Reis
Elly Kourany-Lefoll
Fábio Rocha Formiga
Floriano Paes Silva Júnior
Guilherme Corrêa de Oliveira
Guillaume Mitta
Jeann Marie da Rocha Marcelino
Jennifer Frances Friedman
John Russell Stothard
José Carlos Bina de Araújo
José Rodrigues Coura
Jose Tavares Carneiro Neto
Kabatereine Bujune Narcis
Lester Chitsulo
Liliane Maria Vidal Siqueira
Luciano Kalabric
Lúcio Macêdo Barbosa
Luiz Antonio Rodrigues de Freitas
Marcelo Rosado Fantappié
Márcia Maria de Souza
Marcos André Vannier dos Santos
Martin johannes enk
Matty Knight
Maurício Lima Barreto
Mitermayer Galvão dos Reis
Mônica Ammon Fernandez
Naftale Katz
Neuza Maria Alcântara-Neves
Omar dos Santos Carvalho
Otavio Sarmento Pieri
Pauline Ngina Mwinzi
Paulo Marcos Zech Coelho
Philip Thomas LoVerde
Raymundo Paraná Ferreira Filho
Ricardo José de Paula Souza e Guimarães
Ricardo Riccio Oliveira
Roberta Lima Caldeira
Rodrigo Corrêa-Oliveira
Rodrigo Guerino Stabeli
Ronald Blanton
Ronaldo Amaral
Ronaldo Guilherme Carvalho Scholte
Rosa Castália França Ribeiro Soares
Sheila Andrade de Oliveira
Silvana Aparecida Rogel Carvalho Thiengo
Tereza Cristina Favre
Theomira Mauadie de Azevedo Carmo
William Evan Secor
Zilton de Araújo Andrade

INFORMAÇÕES GERAIS / *GENERAL INFORMATION*

LOCAL DO EVENTO / *EVENT'S PLACE*

Bahia Othon Palace Hotel

Av. Oceânica, 2294, Ondina, Salvador, BA, CEP 40170-010

TEL: +55(71) 2103-7100

http://www.othon.com.br/salvador/

SECRETARIA EXECUTIVA / *EXECUTIVE SECRETARY*

Arena Eventos

Av. Marques de Leão. Nº293- Barra, CEP 40140-230 Salvador - BA.

Tel.Fax: +55(71)3331-8254 / 3033-0092 / 9195-0492

E-mail: arena.augusto@gmail.com

HORÁRIOS DO CONGRESSO / *SCHEDULES OF THE CONGRESS*

Dia 09/08 – Domingo > 08h00 às 19h00 / *Day 08/09 – Sunday > 08h00am to 07h00pm*

Dia 10/08 – Segunda-feira > 08h00 às 18h30 / *Day 08/10 – Monday > 08h00am to 06h30pm*

Dia 11/08 – terça-feira > 08h00 às 13h00 / *Day 08/11 – Tuesday > 08h00am to 1h00pm*

A comissão organizadora solicita a todos os participantes das atividades científicas que respeitem rigorosamente os horários de início e término de suas apresentações. / *The organizing committee asks all participants of scientific activities to strictly respect the start and end times of their presentations.*

RESTAURANTE OFICIAL / RESTAURANT OFFICIAL

O Restaurante do Congresso está a cargo do Restaurante Lampião / The Restaurant Congress is in charge of Restaurant Lampião

REGRAS DO EVENTO / *RULES OF THE EVENT*

1 – Em caso de desistência comunicar à Secretaria. / *In case of withdrawal, notify the Executive Secretary*

2 – Caso os cursos trans-congresso não atinjam a quantidade mínima de participantes, poderão ser canceladas e participantes remanejados de turma. / *If the trans-Congress courses*

do not reach the minimum number of participants, they may be canceled or participants reassigned to another class.

3 – Vagas Limitadas / *Places Limited*

4 – Ao congressista / *For participants*:

a) Crachás de identificação, pasta e impressos. / *Identification Badges, folder and printed materials*
b) Participação nas atividades científicas. / *Participation in scientific activities.*
c) Certificados de participação serão entregues ao final do simpósio / *Certificates will be available at the end of the symposium.*

MEDIA DESK / *MEDIA DESK*

A sala de media desk funcionará nos mesmos horários da secretaria local. O material dos palestrantes deverá ser entregue com antecedência mínima de 2 (duas) horas visando o bom atendimento e adequada organização no sistema de projeção. / *The media room desk operates at the same times as the local office**.** The speakers' materials must be delivered at least two (2) hours prior to presentation to allow for adequate organization and transfer to the projection system.*

CERTIFICADOS / *CERTIFICATES*

Certificados de participação serão entregues ao final do simpósio / Certificates will be available at the end of the symposium.

CRACHÁ / *BADGE*

É obrigatório o uso do crachá em **todas** as áreas do congresso. / *You must use the badge in **all** areas of the Symposium.*

FUMO / *SMOKING*

Recomenda-se não fumar no local do evento e será expressamente proibido fumar nos auditórios e salas. / *It is recommended that you not to smoke at the venue and smoking is forbidden in the halls and rooms.*

CELULAR / *CELL PHONE*

Em respeito aos palestrantes, solicitamos que todos os celulares estejam desligados dentro dos auditórios e salas. / Out of *respect for the speakers, we ask that all cell phones be turned off inside the auditoriums and halls*

ACHADOS E PERDIDOS / *LOST AND FOUND*

Em caso de perda de objetos, favor dirigir-se à secretaria do evento. O Congresso não se responsabiliza por perdas. */ In case of lost property, please go to the executive secretary of the event. The Symposium is not responsible for lost items.*

TRABALHOS / PAPERS

APRESENTAÇÃO ORAL / *ORAL PRESENTATION*

Os trabalhos selecionados na categoria APRESENTAÇÃO ORAL terão 10 minutos (7 minutos de apresentação oral e 3 minutos de discussão). Deve ser feito em formato PowerPoint e entregue na sala de Media Desk com duas horas de antecedência ao início da sessão. Não será permitida a utilização de pen drive ou computador particular diretamente nos equipamentos do auditório. Os certificados serão entregues ao final da sessão.

The works selected in the category ORAL PRESENTATION will have 10 minutes (7-minute delivery and three minutes of discussion). The slides should be put into PowerPoint format and delivered to the Media Desk two hours before the start of the session. The use of pen drives or personal computers will not be allowed on auditorium equipment. Certificates for speakers will be delivered at the end of the session.

PÔSTER / *POSTER*

Área temática / *Thematic area*	Data de exposição / *Date of exhibition*	Fixação do Pôster / *Fixinng the poster*	Retirada do Pôster / *Poster withdrawal*
OP1: Epidemiologia e Controle da Esquistossomose ***OP1: Schistosomiasis Epidemiology and Control***	**09 DE AGOSTO / AUGUST 09th**	**08H00**	**18H00**
OP2: Clínica, Diagnóstico e Tratamento da Esquistossomose ***OP2: Clinical, Diagnostic and Treatment of Schistosomiasis***	**09 DE AGOSTO / AUGUST 09th**	**08H00**	**18H00**
OP3: Imunopatogênese, Genética e Biologia Molecular da Esquistossomose ***OP3: Immunopathogenesis, Genetic and Molecular Biology of Schistosomiasis***	**10 DE AGOSTO / AUGUST 10th**	**08H00**	**18H00**
OP4: Educação, Comunicação, Informação e Hospedeiro Intermediário ***OP4: Education, Communication, Information and Intermediate Host***	**10 DE AGOSTO / AUGUST 10th**	**08H00**	**18H00**

Os apresentadores devem estar presentes ao lado de seus pôsteres das 12H00 às 13H30 para perguntas e discussão / *Presenters should be present at their posters from 12H00pm to 1H30pm for questions and discussion.*

Os pôsteres deverão ser expostos no saguão de exposição do evento / *The posters will be displayed at the lobby exhibition of the event.*

Os certificados dos pôsteres estarão disponíveis ao final do dia de exposição. / *Certificates for poster presentations will be available at the end of the exposure day.*

TRADUÇÃO SIMULTÂNEA / *SIMULTANEOUS TRANSLATION*

Haverá tradução simultânea em inglês/português, nas atividades com participação dos convidados estrangeiros durante o evento. / *There will be simultaneous translation English / Portuguese for sessions where foreign guests are the presenters.*

Para a retirada dos fones de tradução, é necessário entregar um documento de identidade. / *For use of the translation headphones, you will need to leave an identity document.*

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PROGRAMA CIENTÍFICO

DOMINGO, 9 DE AGOSTO		
CURSO DE CURTA DURAÇÃO		
	Sala Ondina C	**Sala Ondina B**
08:00-09:00	**SC1 Técnicas aplicadas ao diagnóstico da esquistossomose (Exame de fezes e POC-CCA)** Neuza M. Alcântara Neves (UFBA) Liliane Maria Vidal Siqueira (CPqRR/FIOCRUZ)	**SC2 Malacologia: Coleta e identificação de caramujos** Mônica Fernandez (IOC/FIOCRUZ) Cristiane Lafeta Mendonça (CPqRR/FIOCRUZ)
CONFERÊNCIA (Ondina C)		
09:00-09:30	**C1 Perspectiva de controle de transmissão e eliminação da esquistossomose no Brasil** **Presidente :** Mitermayer Galvão dos Reis (CPqGM/FIOCRUZ) **Conferencista :** Rosa Castália França Ribeiro Soares (SVS/MS)	
09:30-10:00	**C2 Visão geral do Consórcio para Pesquisa e Avaliação Operacional na Esquistossomose (SCORE)** **Presidente :** Rodrigo Correa-Oliveira (CPqRR/FIOCRUZ) **Conferencista :** Daniel G. Colley (University of Georgia)	
INTERVALO (10:00-10:20)		
MESA REDONDA		
	Sala Ondina C	**Sala Ondina B**
10:20-12:00	**RT1 Situação atual da Esquistossomose: Controle no Braisl, África e Ásia** **Moderador:** Jeann Marie Marcelino (SVS/MS) **Palestrante 1:** Naftale Katz (CPqRR/FIOCRUZ) **Palestrante 2:** Lester Chitsulo (NTD/WHO) **Palestrante 3:** Narcis B Kabatereine (Ministry of Health, Uganda)	**RT2 Epidemiology, Presentation and Pathology of Schistosomiasis** **Moderador :** José Carlos Bina de Araújo (UFBA) **Palestrante 1:** Jose Tavares Carneiro Neto (UFBA) **Palestrante 2:** Raymundo Paraná F. Filho (UFBA) **Palestrante 3:** Luiz Antonio R. de Freitas (CPqGM/FIOCRUZ)
ALMOÇO E SESSÃO DE POSTER (12:00-13:30)		
APRESENTAÇÕES ORAIS		
	Sala Ondina C	**Sala Ondina B**
13:30-15:00	**OP1 Epidemiologia e Controle da Esquistossomose** **Moderador 1:** Maurício Lima Barreto (CPqGM/FIOCRUZ) **Moderador 2:** Otavio Sarmento Pieri (IOC/FIOCRUZ)	**OP2 Clínica, Diagnóstico e Tratamento da Esquistossomose** **Moderador 1:** José Carlos Bina de Araújo (UFBA) **Moderador 2:** Martin Johannes Enk (IEC/SVS)
INTERVALO (15:00-15:20)		
MESA REDONDA		
	Sala Ondina C	**Sala Ondina B**
15:20-17:00	**RT3 Formulação Pediátrica do Praziquantel** **Moderador :** Rodrigo G. Stabeli (FIOCRUZ) **Palestrante 1:** J. Russell Stothard (Liverpool School of Tropical Medicine) **Palestrante 2:** Elly Kourany-Lefoll (Merck Serono) **Palestrante 3:** Daniel Lacerda de Oliveira (FARMANGUINHOS/FIOCRUZ) **Palestrante 4:** Amaya Bustinduy (Liverpool School of Tropical Medicine)	**RT4 Esquistossomose, Ambiente e Saneamento** **Moderador :** Carlos Eduardo Grault (ENSP/FIOCRUZ) **Palestrante 1:** Constança Barbosa (CPqAM/FIOCRUZ) **Palestrante 2:** Tereza C. Favre (IOC/FIOCRUZ) **Palestrante 3:** Alceu Galvão (Inst. Trata Brasil)
CONFERÊNCIA (Ondina C)		
17:00-17:30	**C3 Tratamento de Mulheres Grávidas** **Presidente :** Amaya Bustinduy (Liverpool School of Tropical Medicine) **Conferencista :** Jennifer F. Friedman (Brown University)	
17:30-18:00	**C4 Patologia da Esquistossomose** **Presidente :** Manoel Barral Netto (CPqGM/FIOCRUZ) **Conferencista :** Zilton de Araújo Andrade (CPqGM/FIOCRUZ)	
CERIMÔNIA DE ABERTURA (Ondina C)		
19:00	**Premiação de Teses e Dissertações** **Tributos a Ronaldo Amaral, Lester Chitsulo e Zilton Andrade**	

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SEGUNDA, 10 DE AGOSTO		
CURSO DE CURTA DURAÇÃO		
	Sala Ondina C	**Sala Ondina B**
08:00-09:00	**SC3 GIS Aplicado ao Estudo da Esquistossomose** Ronaldo Guilherme C. Scholte (SVS-MS)	**SC4 Trabalhando com o genoma do *Schistosoma*** Guilherme Corrêa de Oliveira (CPqRR/FIOCRUZ)
CONFERÊNCIA (Ondina C)		
09:00-09:30	**C5 Administração de Praziquantel em Massa para Controle da Esquistossomose no Quênia** **Presidente:** Eliana Reis (CPqGM/FIOCRUZ) **Conferencista:** William Evan Secor (CDC)	
09:30-10:00	**C6 Avaliação de Métodos Diagnósticos** **Presidente:** Paulo Marcos Zech Coelho (CPqRR/FIOCRUZ) **Conferencista:** Charles H. King (CWRU)	
INTERVALO (10:00-10:20)		
MESA REDONDA		
	Sala Ondina C	**Sala Ondina B**
10:20-12:00	**RT5 Alvo Terapêutico e Formulação de Novos Compostos para Tratamento da Esquistossomose** **Moderador:** Marcos André Vannier (CPqGM/FIOCRUZ) **Palestrante 1:** Marcelo Rosado Fantappié (UFRJ) **Palestrante 2:** Fábio Rocha Formiga (CPqGM/FIOCRUZ) **Palestrante 3:** Philip LoVerde (University of Texas)	**RT6 Estudo dos Hospedeiros Intermediários** **Moderador:** Roberta Lima Caldeira (CPqRR/FIOCRUZ) **Palestrante 1:** Omar dos Santos Carvalho (CPqRR/FIOCRUZ) **Palestrante 2:** Silvana Carvalho Thiengo (IOC/FIOCRUZ) **Palestrante 3:** Guillaume Mitta (Université de Perpignan)
ALMOÇO E SESSÃO DE POSTER (12:00-13:30)		
APRESENTAÇÕES ORAIS		
	Sala Ondina C	**Sala Ondina B**
13:30-15:00	**OP3 Imunopatologia, Genética e Biologia Molecular da Esquistossomose** **Moderador 1:** Lúcio Macêdo Barbosa (CPqGM/FIOCRUZ) **Moderador 2:** Márcia M. de Souza (CPqGM/FIOCRUZ)	**OP4 Educação, Comunicação, Informação e Hospedeiros Intermediários** **Moderador 1:** Marcos André Vannier (CPqGM/FIOCRUZ) **Moderador 2:** Cristiano Lara Massara (CPqRR/FIOCRUZ)
INTERVALO (15:00-15:20)		
MESA REDONDA		
	Sala Ondina C	**Sala Ondina B**
15:20-17:00	**RT7 Projeto SCORE** **Moderador:** Daniel G. Colley (Georgia University) **Palestrante 1:** Charles H. King (CWRU) **Palestrante 2:** David Rollinson (The Natural History Museum - London) **Palestrante 3:** Pauline Mwinzi (Kenya Medical Research Institute)	**RT8 Imunomodulação e Imunopatogênese da Esquistossomose** **Moderador:** Ricardo Riccio Oliveira (CPqGM/FIOCRUZ) **Palestrante 1:** Luciana Santos Cardoso (UFBA) **Palestrante 2:** Alain Dessein (Université de la Mediterraneé) **Palestrante 3:** Cristina Toscano Fonseca (CPqRR/FIOCRUZ)
CONFERÊNCIA (Ondina C)		
17:00-17:30	**C7 Genética de Populações do Hospedeiro Intermediário do *S. mansoni*** **Presidente:** Theomira Mauadie A. Carmo (CPqGM/FIOCRUZ) **Conferencista:** Matty Knight (The George Washington University)	
17:30-18:00	**C8 Genética de Populações do *S. mansoni*** **Presidente:** Carlos Graeff Teixeira (PUC/RGS) **Conferencista:** Ronald E. Blanton (CWRU)	

TERÇA, 11 DE AGOSTO		
CURSO DE CURTA DURAÇÃO		
	Sala Ondina C	**Sala Ondina B**
08:00-09:00	**SC5 Técnicas de GIS e Modelagem Espacial** Ricardo José Guimarães (Inst. Evandro Chagas) Elainne Christine S. Gomes (CPqAM/FIOCRUZ)	**SC6 Metodologia para o Estudo de Genética de Populações do *S. mansoni*** Lúcio Macêdo Barbosa (CPqGM/FIOCRUZ) Luciano Kalabric (CPqGM/FIOCRUZ)
MESA REDONDA		
	Sala Ondina C	**Sala Ondina B**
09:00-10:40	**RT9 Aspectos Clínicos e Terapêuticos** **Moderador:** José Rodrigues Coura (IOC/FIOCRUZ) **Palestrante 1:** Floriano Paes Silva Júnior (IOC/FIOCRUZ) **Palestrante 2:** Ana Lúcia Coutinho Domingues (UFPE) **Palestrante 3:** Antonio Andrade Filho (UFBA)	**RT10 Educação, Comunicação e Informação** **Moderador:** Andréa Gazzinelli (UFMG) **Palestrante 1:** Andréa Gazzinelli (UFMG) **Palestrante 2:** Marcos André Vannier (CPqGM/FIOCRUZ) **Palestrante 3:** Cristiano Lara Massara (CPqRR/FIOCRUZ)
INTERVALO (10:40-11:00)		
MESA REDONDA (Ondina C)		
11:00-12:40	**RT11 Estado da Arte na Esquistossomose: Imunologia e desenvolvimento de vacina** **Moderador:** Akira Homma (BIOMANGUINHOS/FIOCRUZ) **Palestrante 1:** Soraya Torres Gaze Jangola (CPqRR/FIOCRUZ) **Palestrante 2:** Donald Harn (University of Georgia) **Palestrante 3:** Afzal A. Siddiqui (Texas Tech University)	
CONSIDERAÇÕES FINAIS (Ondina C)		
12:40-13:00	Tereza C. Favre (PIDE/FIOCRUZ Coordenador) Rosa Castália França Ribeiro Soares (SVS/MS) Rodrigo G. Stabeli (VPPLR/FIOCRUZ) Mitermayer Galvão dos Reis (Presidente of 14o Simpósio)	

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SCIENTIFIC PROGRAM

SUNDAY, AUGUST 9		
SHORT COURSE		
	Room Ondina C	**Room Ondina B**
08:00-09:00	**SC1 Techniques Applied to the Diagnosis of Schistosomiasis (Fecal examination & POC-CCA)** Neuza M. Alcântara Neves (UFBA) Liliane Maria Vidal Siqueira (CPqRR/FIOCRUZ)	**SC2 Malacology: Collection and Identification of Snails** Mônica Fernandez (IOC/FIOCRUZ) Cristiane Lafeta Mendonça (CPqRR/FIOCRUZ)
CONFERENCE (Ondina C)		
09:00-09:30	**C1 Brazil Perspective on Transmission Control and Elimination of Schistosomiasis** **Chair:** Mitermayer Galvão dos Reis (CPqGM/FIOCRUZ) **Speaker:** Rosa Castália França Ribeiro Soares (SVS/MS)	
09:30-10:00	**C2 An overview of the Schistosomiasis Consortium for Operational Research and Evaluation (SCORE)** **Chair:** Rodrigo Correa-Oliveira (CPqRR/FIOCRUZ) **Speaker:** Daniel G. Colley (University of Georgia)	
BREAK (10:00-10:20)		
ROUNDTABLE		
	Room Ondina C	**Room Ondina B**
10:20-12:00	**RT1 Current Situation of Schistosomiasis: Control in Brazil, Africa and Asia** **Moderator:** Jeann Marie Marcelino (SVS/MS) **Speaker 1:** Naftale Katz (CPqRR/FIOCRUZ) **Speaker 2:** Lester Chitsulo (NTD/WHO) **Speaker 3:** Narcis B Kabatereine (Ministry of Health, Uganda)	**RT2 Epidemiology, Presentation and Pathology of Schistosomiasis** **Moderator:** José Carlos Bina de Araújo (UFBA) **Speaker 1:** Jose Tavares Carneiro Neto (UFBA) **Speaker 2:** Raymundo Paraná F. Filho (UFBA) **Speaker 3:** Luiz Antonio R. de Freitas (CPqGM/FIOCRUZ)
LUNCH & POSTER SECTION (12:00-13:30)		
ORAL PRESENTATIONS		
	Room Ondina C	**Room Ondina B**
13:30-15:00	**OP1 Schistosomiasis Epidemiology and Control** **Moderator 1:** Maurício Lima Barreto (CPqGM/FIOCRUZ) **Moderator 2:** Otavio Sarmento Pieri (IOC/FIOCRUZ)	**OP2 Clinical, Diagnostic and Treatment of Schistosomiasis** **Moderator 1:** José Carlos Bina de Araújo (UFBA) **Moderator 2:** Martin Johannes Enk (IEC/SVS)
BREAK (15:00-15:20)		
ROUNDTABLE		
	Room Ondina C	**Room Ondina B**
15:20-17:00	**RT3 Praziquantel: Pediatric Formulation** **Moderator:** Rodrigo G. Stabeli (FIOCRUZ) **Speaker 1:** J. Russell Stothard (Liverpool School of Tropical Medicine) **Speaker 2:** Elly Kourany-Lefoll (Merck Serono) **Speaker 3:** Daniel Lacerda de Oliveira (FARMANGUINHOS/FIOCRUZ) **Speaker 4:** Amaya Bustinduy (Liverpool School of Tropical Medicine)	**RT4 Schistosomiasis, Environment and Sanitation** **Moderator:** Carlos Eduardo Grault (ENSP/FIOCRUZ) **Speaker 1:** Constança Barbosa (CPqAM/FIOCRUZ) **Speaker 2:** Tereza C. Favre (IOC/FIOCRUZ) **Speaker 3:** Alceu Galvão (Inst. Trata Brasil)
CONFERENCE (Ondina C)		
17:00-17:30	**C3 Treatment of Pregnant Woman** **Chair:** Amaya Bustinduy (Liverpool School of Tropical Medicine) **Speaker:** Jennifer F. Friedman (Brown University)	
17:30-18:00	**C4 Pathology of Schistosomiasis** **Chair:** Manoel Barral Netto (CPqGM/FIOCRUZ) **Speaker:** Zilton de Araújo Andrade (CPqGM/FIOCRUZ)	
OPENING CEREMONY (Ondina C)		
19:00	**Thesis and Dissertations Awards** **Tributes to Ronaldo Amaral, Lester Chitsulo and Zilton Andrade**	

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MONDAY, AUGUST 10		
SHORT COURSE		
	Room Ondina C	**Room Ondina B**
08:00-09:00	**SC3 GIS Applied to the Study of Schistosomiasis** Ronaldo Guilherme C. Scholte (SVS-MS)	**SC4 Working with the *Schistosoma* Genome** Guilherme Corrêa de Oliveira (CPqRR/FIOCRUZ)
CONFERENCE (Ondina C)		
09:00-09:30	**C5 Mass Praziquantel Administration for Control of Schistosomiasis in Kenya** **Chair:** Eliana Reis (CPqGM/FIOCRUZ) **Speaker:** William Evan Secor (CDC)	
09:30-10:00	**C6 Evaluation of Diagnostic Methods** **Chair:** Paulo Marcos Zech Coelho (CPqRR/FIOCRUZ) **Speaker:** Charles H. King (CWRU)	
BREAK (10:00-10:20)		
ROUNDTABLE		
	Room Ondina C	**Room Ondina B**
10:20-12:00	**RT5 Drug Target and Formulation of New Compounds for Schistosomiasis Treatment** **Moderator:** Marcos André Vannier (CPqGM/FIOCRUZ) **Speaker 1:** Marcelo Rosado Fantappié (UFRJ) **Speaker 2:** Fábio Rocha Formiga (CPqGM/FIOCRUZ) **Speaker 3:** Philip LoVerde (University of Texas)	**RT6 Study of Intermediate Hosts** **Moderator:** Roberta Lima Caldeira (CPqRR/FIOCRUZ) **Speaker 1:** Omar dos Santos Carvalho (CPqRR/FIOCRUZ) **Speaker 2:** Silvana Carvalho Thiengo (IOC/FIOCRUZ) **Speaker 3:** Guillaume Mitta (Université de Perpignan)
LUNCH & POSTER SECTION (12:00-13:30)		
ORAL PRESENTATIONS		
	Room Ondina C	**Room Ondina B**
13:30-15:00	**OP3 Immunopathogenesis, Genetic and Molecular Biology of Schistosomiasis** **Moderator 1:** Lúcio Macêdo Barbosa (CPqGM/FIOCRUZ) **Moderator 2:** Márcia M. de Souza (CPqGM/FIOCRUZ)	**OP4 Education, Communication, Information and Intermediate Host** **Moderator 1:** Marcos André Vannier (CPqGM/FIOCRUZ) **Moderator 2:** Cristiano Lara Massara (CPqRR/FIOCRUZ)
BREAK (15:00-15:20)		
ROUNDTABLE		
	Room Ondina C	**Room Ondina B**
15:20-17:00	**RT7 SCORE Project** **Moderator:** Daniel G. Colley (Georgia University) **Speaker 1:** Charles H. King (CWRU) **Speaker 2:** David Rollinson (The Natural History Museum - London) **Speaker 3:** Pauline Mwinzi (Kenya Medical Research Institute)	**RT8 Immunomodulation and Immunopathogenesis of Schistosomiasis** **Moderator:** Ricardo Riccio Oliveira (CPqGM/FIOCRUZ) **Speaker 1:** Luciana Santos Cardoso (UFBA) **Speaker 2:** Alain Dessein (Université de la Mediterraneé) **Speaker 3:** Cristina Toscano Fonseca (CPqRR/FIOCRUZ)
CONFERENCE (Ondina C)		
17:00-17:30	**C7 Population Genetics of Invertebrate Host of *Schistosoma mansoni*** **Chair:** Theomira Mauadie A. Carmo (CPqGM/FIOCRUZ) **Speaker:** Matty Knight (The George Washington University)	
17:30-18:00	**C8 Population Genetics of *Schistosoma mansoni*** **Chair:** Carlos Graeff Teixeira (PUC/RGS) **Speaker:** Ronald E. Blanton (CWRU)	

TUESDAY, AUGUST 11		
SHORT COURSE		
	Room Ondina C	**Room Ondina B**
08:00-09:00	**SC5 Techniques of GIS and Spatial Modeling** Ricardo José Guimarães (Inst. Evandro Chagas) Elainne Christine S. Gomes (CPqAM/FIOCRUZ)	**SC6 Methodology to Study Population Genetics of *Schistosoma mansoni*** Lúcio Macêdo Barbosa (CPqGM/FIOCRUZ) Luciano Kalabric (CPqGM/FIOCRUZ)
ROUNDTABLE		
	Room Ondina C	**Room Ondina B**
09:00-10:40	**RT9 Clinical and Therapeutic Aspects** **Moderator:** José Rodrigues Coura (IOC/FIOCRUZ) **Speaker 1:** Floriano Paes Silva Júnior (IOC/FIOCRUZ) **Speaker 2:** Ana Lúcia Coutinho Domingues (UFPE) **Speaker 3:** Antonio Andrade Filho (UFBA)	**RT10 Education, Communication and Information** **Moderator:** Andréa Gazzinelli (UFMG) **Speaker 1:** Andréa Gazzinelli (UFMG) **Speaker 2:** Marcos André Vannier (CPqGM/FIOCRUZ) **Speaker 3:** Cristiano Lara Massara (CPqRR/FIOCRUZ)
BREAK (10:40-11:00)		
ROUNDTABLE (Ondina C)		
11:00-12:40	**RT11 State of the Art for Schistosomiasis: Immunology and Vaccine Development** **Moderator:** Akira Homma (BIOMANGUINHOS/FIOCRUZ) **Speaker 1:** Soraya Torres Gaze Jangola (CPqRR/FIOCRUZ) **Speaker 2:** Donald Harn (University of Georgia) **Speaker 3:** Afzal A. Siddiqui (Texas Tech University)	
CLOSING REMARKS (Ondina C)		
12:40-13:00	Tereza C. Favre (PIDE/FIOCRUZ Coordinator) Rosa Castália França Ribeiro Soares (SVS/MS) Rodrigo G. Stabeli (VPPLR/FIOCRUZ) Mitermayer Galvão dos Reis (President of 14th Symposium)	

ORAL PRESENTATION SESSIONS

OP1: Schistosomiasis Epidemiology and Control (Ondina C)

OP1-01: Identification of chronic form of Schistosomiasis mansoni in urban area, Pernambuco, 2015. ***Ana Virgínia Barreto*** (CPqAM/FIOCRUZ)

OP1-02: Analysis of the implementation of Schistosomiasis surveillance and treatment through integration with family health teams in Pernambuco, brazil, from 2011 to 2014. ***Bárbara Morgana da Silva*** (Secretaria de Saúde – Pernambuco)

OP1-03: Temporal epidemiological study on the occurrence of severe clinical forms of Schistosomiasis in patients of the Hospital das Clinicas, pernambuco, Brazil, in the period 2010-2014. ***Constança Simões Barbosa*** (CPqAM/FIOCRUZ)

OP1-04: Analysis of mass drug administration (MDA) as a strategy in hyperendemic areas for Schistosomiasis in Pernambuco, Brazil – 2014. ***José Alexandre M. da Silva*** (Secretaria de Saúde – Pernambuco)

OP1-05: Reproductive survey and positivity in Rodent *Holochilus sp.*, natural host of Schistosomiasis, Baixada Ocidental Maranhense. ***Maria Gabriela S. Lira*** (UEMA)

OP1-06: Analysis on the implementation of Schistosomiasis control program in the family health strategy: a case study in coastal and vulnerable town in Pernambuco. ***Mariana Izabel Sena Barreto*** (CPqAM/FIOCRUZ)

OP1-07: Urban Schistosomiasis transmission: new epidemiological scenario in the forest zone of Pernambuco. ***Millena Carla S. Mesquita*** (CPqAM/FIOCRUZ)

OP1-08: Modeling effectiveness of drug administration on a population infected with *Schistosoma mansoni.* ***Roberta de Oliveira Prado*** (UFMG)

OP2: Clinics, diagnostic and treatment of Schistosomiasis (Ondina B)

OP2-02: Ultrastructural evaluation of *Schistosoma mansoni* worms treated with Phthalyl-Thiazole LPQM-48. ***Carlos André L. Miranda Filho*** (UFPE)

OP2-03: EF-24: A curcumin analog with activity in vitro against *Schistosoma mansoni* adult worms. ***Fernanda Rafacho Badoco*** (UNIFRAN)

OP2-04: Prevalence of pseudotrombocytopenia in patients with hepatosplenic Schistosomiasis mansoni. ***Guilherme Vaz de Melo Trindade*** (UFMG)

OP2-05: The role of new diagnostic techniques in the control of Schistosomiasis mansoni in low transmission areas. ***Liliane Maria Vidal Siqueira*** (CPqRR/FIOCRUZ)

OP2-06: *Schistosoma mansoni* infection diagnosis in a low endemic area in northeast Brazil using four different methods. ***Mariana Silva Sousa*** (UFCE)

OP2-07: Use of Point-Of-Care platform to detect Circulating Cathodic Antigen (POC-CCA) in low endemic area: long term follow up post -praziquantel (PZQ) treatment. ***Marta Guimarães Cavalcanti*** (UFRJ)

OP2-08: The role of efflux pumps in *Schistosoma mansoni* praziquantel resistant phenotype. ***Tiago Manuel F. Mendes*** (UNL)

OP3: Immunopathogenesis, genetic and molecular biology of Schistosomiasis (Ondina C)

OP3-01: Genetic linkage analysis of praziquantel resistance. ***Ana Carolina A. de Mattos*** (Texas Tech University)

OP3-02: Influence of infection by *Schistosoma mansoni*, IgG1 and IgG4 anti-SEA and its association to the symptoms of allergic asthma. ***Fernanda Dias da Silva*** (CPqAM/FIOCRUZ)

OP3-03: Assessing the immune mechanisms of the radiation-attenuated Schistosome vaccine by microarray analysis. ***Juliana Vitoriano Souza*** (Butantan)

OP3-04: Differential responses of human epithelial cells from bladder and biliary tract to eggs of *Schistosoma haematobium* and *S. mansoni.* ***Rafael Nacif Pimenta*** (The George Washington University)

OP3-05: Vaccination with recombinant protein 77 from *Schistosoma mansoni* protected mice against parasite challenging. ***Suellen Batistoni de Morais*** (UFMG)

OP3-06: *Schistosoma mansoni* antigens reduces t cells activation in severe asthma. ***Tarcísio Vila Verde S. de Almeida*** (UFBA)

OP3-07: Osteopontin is induced by *Schistosoma mansoni* egg antigens and correlates with fibrosis and portal hypertension in human and experimental Schistosomiasis. ***Thiago de Almeida Pereira*** (Duke University)

OP3-08: Profile of Natural Killer T Cells (NKT) from asthmatic individuals exposed to *Schistosoma mansoni* antigens. ***Yuri Tabajara*** (CPqGM/FIOCRUZ)

OP4: Education, Communication, Information and Intermediate Host (Ondina B)

OP4-01: The utilization of a cartoon in the health education process about Schistosomiasis. ***Felipe Leão Gomes Murta*** (IOC/FIOCRUZ)

OP4-02: Presence of susceptible molluscs in a public day care in Aracaju, Sergipe. ***Luciene Barbosa*** (UFSE)

OP4-03: Education for Schistosomiasis prevention in Brazil. ***Ana Márcia Suarez Fontes*** (CPqGM/FIOCRUZ)

OP4-04: VANTS como instrumento de inquérito malacológico. ***Paulo César Florentino Marques*** (UFRPE)

OP4-05: Spatial mapping of snails foci Schistosomiasis transmitters in Baixada Ocidental Maranhense - São Bento city. ***Ranielly Araújo Nogueira*** (UEMA)

OP4-06: Use of mobile technology for study of Schistosomiasis. ***Ricardo Guimarães*** (IEC)

OP4-07: Evaluating impact of educational actions on Schistosomiasis prevalence among schoolchildren in the municipality of Malacacheta, Minas Gerais, Brazil. ***Karina Cabello*** (IOC/FIOCRUZ)

OP4-08: Freshwater gastropods and associated helminths from the Baixada Maranhense Microregion, MA, with emphasis on Schistosomiasis transmitters. ***Silvana Carvalho Thiengo*** (IOC/FIOCRUZ**)**

14º

Simpósio Internacional sobre Esquistossomose

International Symposium on Schistosomiasis

Salvador, Brazil

August 9 -11, 2015

Secretaria de Vigilância em Saúde

Ministério da Saúde

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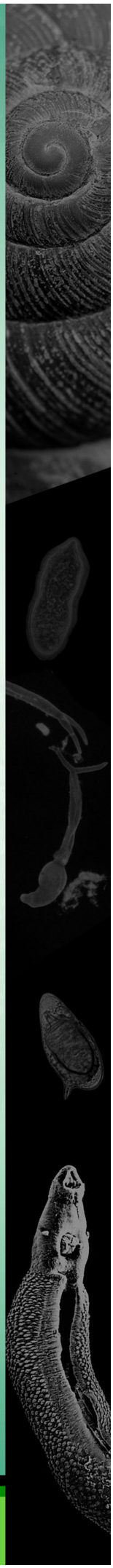

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ABSTRACT – PROCEDIMENTOS PARA SUBMISSÃO

INFORMAÇÕES GERAIS 4

- Abstracts (em Inglês) serão submetidos apenas online, através do website www.bahia.fiocruz.br/schisto2015. O prazo final para submissão será **30 de Junho de 2015**.
- Não serão aceitos resumos após o prazo estabelecido. O Comitê Científico reserva-se ao direito de recusar qualquer abstract escrito com Inglês inadequado ou que contenham erros ortográficos. Este Comitê verificará a adequação dos abstracts para apresentação no congresso e a publicação nos anais.
- Os melhores abstracts serão selecionados para apresentação oral durante o simpósio. Os critérios para seleção serão tanto a qualidade científica como o grau de interesse geral. Após a seleção, o primeiro autor que apresentar o estudo oralmente deverá ser um estudante de pós-graduação ou pós-doutorado.
- Será aceito apenas um abstract submetido por autor. O autor que apresentar o estudo deverá estar registrado no Congresso. Por favor registre-se antes do fim do prazo de submissão dos abstracts em 30 de Junho de 2015.
- Cada abstract será classificado nas seguintes áreas:
  - Epidemiologia e Controle da esquistossomose
  - Clínica, diagnóstico e tratamento da Esquistossomose
  - Imunopatogênese, genética e biologia molecular da Esquistossomose
  - Educação, Comunicação e Informação

Atenção:

O abstract poderá ser anexado posteriormente à sua inscrição, até a data limite (30 de Junho de 2015). Para submissão de abstract posterior à inscrição, será necessário acessar o sistema novamente, informando seu login e senha gerados durante o cadastro.

FORMATO

Título: TÍTULO COMPLETO EM LETRAS MAIÚSCULAS (em negrito)

Author(es): NOME COMPLETO DOS AUTORES EM LETRAS MAIÚSCULAS.

Instituição: Informar o nome da Instituição de todos os Autores

Texto: Subtítulo (Introdução, Métodos e Resultados, Conclusão)

Nota de rodapé: Indicar as fontes de apoio financeiro

Os abstracts que não cumprirem as especificações acima não serão aceitos. Deve ser dada atenção especial para a escrita em Inglês, abstracts contendo erros gramaticais ou de ortografia serão rejeitados.

Elaboração do Abstract: Máximo de 2500 caracterers (incluindo espaços).

APROVAÇÃO E REGRAS

A carta de aceitação para o abstract aprovado estará disponível através do site www.bahia.fiocruz.br/schisto2015 até 07 de julho de 2015, incluindo todas as informações e as regras necessárias.

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LIVRO DE RESUMOS

OP1-01

IDENTIFICATION OF CHRONIC FORM OF SCHISTOSOMIASIS MANSONI IN URBAN AREA, PERNAMBUCO, 2015 .

Autores: ANA VIRGÍNIA MATOS SÁ BARRETO[1], ANA LÚCIA COUTINHO DOMINGUES[2], ELLYDA VANESSA GOMES DA SILVA[1,3], EDMUNDO LOPES[2], SILVIA MARIA LUCENA MONTENEGRO[1], CLARICE N LINS DE MORAIS[1]

1- Centro de Pesquisas Aggeu Magalhães/Fiocruz-PE; 2- Hospital das Clínicas/UFPE; 3- Secretaria Municipal de Saúde de Jaboatão dos Guararapes.

Background: The schistosomiasis is considered a rural endemic disease, which is expanding to urban and coastal areas of Pernambuco, with the appearance of human cases and intermediate host's foci. The municipality of Jaboatão dos Guararapes is located in the Metropolitan Region of Recife and among the existing water sources, is the Náutico lagoon. Quite silted, the lagoon is influenced by tides, flooding the river Jaboatão and pollution by sewage and garbage of settlements located around it. From 2010 to 2014 were recorded an average of 350 parasitological positive stool for *Schistosoma mansoni* per year with an average of 3.2% positively. However lacks data to confirm the amount of chronic forms. The goal is to present the preliminary data from the ultrasound survey conducted in health units of Jaboatão with a history of schistosomiasis cases and located around the lagoon. **Methods:** In the period from April to June/2015 ultrasonographical evaluation was performed in subjects who attended the following criteria: residents of areas of study with history of contact with contaminated water and/or parasitological stools positive for *S. mansoni*, aged 18-70 years, of both sexes. A specialist in the diagnosis imaging of schistosomiasis, using portable equipment, to identify the clinical forms and pattern of periportal fibrosis (PPF), performed ultrasonography. **Results:** Six task forces have already realized in four health units, with 182 ultrasound. The average age was 41.6 years with 106 (58.2%) women and 76 (41.8%) men. Of the individuals analyzed, 88 (48.4%) had the chronic form, of which 48 (26.4%) with hepatointestinal form, 31 (17%) hepatic form and 9 (4.9%) with hepatosplenic form. In relation to PPF were classified: 15 (8.2%) with pattern A (without PPF), 13 (7.1%) with pattern B (debatable PPF), 81 (44.5%) pattern C (peripheral PPF), 46 (25.3%) pattern D (center), 14 (7.7%) pattern E (advanced PPF) and 3 (1.6%) with very advanced PPF (pattern F). In 10 patients, the FFP cannot be classified. **Conclusion**: In the municipality of Jaboatão, around Náutico lagoon, about half the schistosomiasis cases presents the chronic form and with the same distribution of clinical cases and PPF found in rural areas. These preliminary data suggest the need for continued vigilance by establishing a regionalized and hierarchical network for monitoring chronic cases, in order to prevent their progress to more severe forms.

Financial support: The study received financial support of FACEPE/PPSUS APQ-0057.4.00/13

OP1-02

ANALYSIS OF THE IMPLEMENTATION OF SCHISTOSOMIASIS SURVEILLANCE AND TREATMENT THROUGH INTEGRATION WITH FAMILY HEALTH TEAMS IN PERNAMBUCO, BRAZIL, FROM 2011 TO 2014.

AUTHORS: Bárbara Morgana da Silva[1], Cassandra Costa[1] José Alexandre Menezes da Silva[1] Camylla Valença Valença Saucha[1], José Holanda Neto[1], Gleice Maria dos Santos[1], Oswaldo Barbosa da Costa Neto[1], Fabiane Aragão Rodrigues de Carvalho[1], Daniele Mendonça Ferreira[1], Cintia Brito[1], Aymée Medeiros[1], Pietra Lemos Costa[1], Anabelle Bezerra Ferreira[1], Rafael Ferreira de França[1], Vânia Glaucinele da Silva Benigno[1], Andrea Santos de Oliveira[1], José Alexandre Menezes da Silva[1]

[1] *Secretariat of Health, Pernambuco State*

INTRODUCTION: In Pernambuco, endemy control agents (ECA) have historically performed surveillance and control of schistosomiasis. Until 1998, agents of the National Health Foundation carried out those activities, which were decentralized to the municipal agents in 1999. Even with the expansion of community health agents (CHA) and family health teams (FHT) in 2000, surveillance and control of schistosomiasis were still strongly related to the actions of ECA until 2010. From 2011 on, the SANAR Program of the Secretariat of Health of Pernambuco's main objective has been to improve the implementation of schistosomiasis surveillance and control through integration with FHT. **METHODS:** We chose the Selective Treatment (ST) to implement the surveillance and control of schistosomiasis, along with FHT and CHA, in locations with a positivity rate < 10%. After meetings and trainings with teams in their own units, we established that each CHA would approach 5 users from their territory, giving them feces collectors and advising them about the disease. As for doctors and nurses, we established the reception, treatment and clinical evaluation of positive patients. When necessary, they were forwarded to reference units. Each CHA adapted the flow of giving the collectors and receiving them according to their work routine. **RESULTS:** Between 2012 and 2014 we advised 369 FHT in 40 priority cities and reached 2,124 professionals, including CHA, nurses and doctors. In 2010 we performed 65,639 tests; in 2014, 127,711 tests were performed, which meant an increase of 94.5%. A detailed monitoring carried out in 2014 in a sample of 103 out of the 369 units showed that 73% of the professionals adhered to the ST. Monitoring of positive cases by a nurse or doctor occurred in 90% of the FHT units, but only 60% were receiving medication, schistosomiasis control records and feces collectors. The positivity rate for schistosomiasis was 9.8% in 2010 in the locations covered by FHT. In 2014 it decreased to 4.5%. **CONCLUSION:** The ST strategy has been well accepted by the FHT we worked with and resulted in an increase in access to tests and treatment coverage for positive cases. Problems related to the availability of materials and medication show the need for strengthening the integration between health surveillance and FHT.

Funding sources: Secretariat of Health, Pernambuco State

OP1-03

TEMPORAL EPIDEMIOLOGICAL STUDY ON THE OCCURRENCE OF SEVERE CLINICAL FORMS OF SCHISTOSOMIASIS IN PATIENTS OF THE HOSPITAL DAS CLINICAS, PERNAMBUCO, BRAZIL, IN THE PERIOD 2010-2014

CONSTANÇA SIMÕES BARBOSA[1], JULYANA VIEGAS CAMPOS[1], ELAINNE CHRISTINE DE SOUZA GOMES[1], KARINA CONCEIÇÃO ARAUJO[2], MILLENA MESQUITA[1], SOLANGE LAURENTINO DOS SANTOS[3], ANA LUCIA COUTINHO DOMINGUES[4]

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[4] Programa de Pós-graduação em Medicina Tropical, Universidade Federal de Pernambuco - UFPE

INTRODUCTION: Successive treatments of schistosomiasis cases in Brazil endemic areas over the past 20 years induced a decrease in severe hepatosplenic clinical forms and also in mortality from upper gastrointestinal bleeding (ANDRADE, 1998). Despite this, the satate of Pernambuco still has (1) highest percentage of schistosomiasis deaths and hospitalizations; (2) several cases of myelorradiculapaties; (3) persistence of high parasite loads in endemic localities (ARAÚJO 2007; BARBOSA 2006; RESENDES, 2005). This epidemiological situation justifies the present research seeking to update the morbidity of schistosomiasis in this state. OBJECTIVE: Conduct an epidemiological research into the frequency and annual evolution of patients with severe clinical forms of schistosomiasis treated at Hospital das Clinicas (HC), Pernambuco. METHODS: epidemiological study with retrospectively analyze using data collected on clinical records of HC gastroenterology sector during the period 2010-2014. Variables entered into a Microsoft Excel Database 2007: gender, age, clinical forms, liver fibrosis patterns, upper gastrointestinal bleeding, ascites, collateral circulation. PARCIAL RESULTS: In this period were recorded 1,079 schistosomiasis cases with 68.5% (n 740) with hepatosplenic clinical form (HE) and 62.9% (n 466) in age 20-59 years,

considered young adults. Among the total HE cases, 6.5% (n 48) had ascites, 40.1% (n 297) upper gastrointestinal bleeding and 32.3% (n 239) has been splenectomized. The pattern of liver fibrosis + EC (advanced) and F + CF (very late) occurred in 63.2% (n 468) of HE cases. Between 2010-2013 the number of HE cases remained stable and in 2014 there was a drop in HE patients who reached the hospital (2010> 183; 2011> 212; 2012> 169; 2013> 106; 2014> 70). Research is being completed to allow temporal statistical analysis of the hospital occurrence of severe clinical forms of schistosomiasis in Pernambuco in the last 15 years.

Keywords: schistosomiasis, clinical forms of schistosomiasis, schistosomiasis epidemiology, hepatosplenomegaly schistosomiasis

OP1-04

ANALYSIS OF MASS DRUG ADMINISTRATION (MDA) AS A STRATEGY IN HYPERENDEMIC AREAS FOR SCHISTOSOMIASIS IN PERNAMBUCO, BRAZIL – 2014

AUTORES: José Alexandre Menezes da Silva[1], Flávia Silvestre Outtes Wanderley[1], Gina Cristina Freitas Farias[1], Ana Beatriz Rigueira[1], Andrea Santos de Oliveira[1], Rafael França[1], Aymée Medeiros[1], Cintia Brito[1], Anabelle Ferreira[1], Ana Virgínia Matos Sá Barreto[1], Bárbara Morgana da Silva[1],

[1] *Secretariat of Health, Pernambuco State*

INTRODUCTION: Pernambuco has one of the highest prevalences (7.9% in 2010), highest number of deaths (on average 200 per year) and highest mortality rates (2.7/100,000 population) for schistosomiasis among all Brazilian states. In 2011, the Secretariat of Health of Pernambuco created the SANAR Program, which established that one of its goals was to reduce schistosomiasis positivity rates to less than 10%, until 2014, in 119 hyperendemic locations (HL) where approximately 146,000 people live. This study aims to describe and analyze the results of MDA for schistosomiasis in HL of Pernambuco. **METHODS:** This is a descriptive ecological study using the data obtained from the Schistosomiasis Control Program's Information System (SCPIS). SANAR defined the baseline for the 119 HL as = or >10% in 2010 and 2011 and determined that 3 rounds of MDA should be carried out between 2012 and 2014. We used Microsoft Excel 2010 to analyze the data. **RESULTS:** The average positivity ratein the 119 HL before MDA was 18%, varying from 10% to 70.6%. Among the 119 HL, 26 (21%) carried out 3 rounds of MDA until 2014 and 93 (79%) carried out 2 rounds. The average positivity rate for schistosomiasis in the 119 HL was 2.9% (0% to 25%) in 2014, which means a decrease of 84% in positivity. The MDA coverage median for the eligible population was 75% (12% to 100%), with little variation after 3 rounds of MDA. **CONCLUSION:** Although most HL have not carried out all 3 rounds of MDA, we noticed a significant decrease in schistosomiasis positivity rates, which shows the effectivity of treatment with Praziquantel. Analysis of the MDA coverage median shows that the population adhered well to the strategy. This action can also enable the reduction of severe forms to parasitized people who would possibly not detected. Integrated interventions and improvement of sanitation conditions are necessary to sustainability the low positivity rates.

Funding sources: *Secretariat of Health, Pernambuco State*

OP1-05

REPRODUCTIVE SURVEY AND POSITIVITY IN RODENT *HOLOCHILUS* SP., NATURAL HOST OF SCHISTOSOMIASIS, BAIXADA OCIDENTAL MARANHENSE

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ABSTRACT

Introduction: Schistosomiasis is an endemic disease caused by *Schistosoma mansoni* helminth and that affects patients around the world, mainly in the states of northeastern Brazil. Currently this disease has a endemic character, mainly in the region of Maranhão Lowlands, where it was found that cohabiting two definitive hosts of *S. mansoni*: the man and the wild rodent *Holochilus* genre, where the latter is integrated with its semi-aquatic habit the ecology of the region, which has a seasonal dry period and rainy. Today, it is known that the wild rodent is an important link in the epidemiological chain of schistosomiasis, which may act as a potential natural reservoir. Besides, the reproductive cycle of rodent *Holochilus* sp. It is similar to other small mammals in the tropics, presenting a gestation that lasts on average 21 days, resulting in approximately seven pups per litter. In the present work aimed to analyze the reproductive aspects and positive for *Schistosoma mansoni* in rodent *Holochilus* gender, in São Bento – MA. **Methods and Results:** For this, monthly captures were conducted up to 10 rodents *Holochilus* sp. randomly for sex, taking note of the seasonal period of São Bento in each month of capture. In laboratory rodents had feces analyzed for *S. mansoni* infection by the Kato-Katz method. After the analysis, they were adequately anesthetized for obtaining full length, weight and sex determination. In females, the incision of the ventral portion of the body was carried out to verify the presence of embryos and count them. Among the captured rodents dominance occurred males in almost all months and they tended to be larger and heavier than females. With regard to *S. mansoni* infection and reproductive activity of animals, both factors were higher in rainy season of São Bento. As for the number of embryos, it was observed that also during the rainy season of São Bento, this number has grown greatly reaching 12 embryos to be found in one animal. **Conclusion:** All in all, rodents showed an intense reproductive activity, especially in the rainy season. The high rate of infection with *S. mansoni* along the high reproduction showed that rodents are factors that help in maintaining and consequently aggravate schistosomiasis in the Baixada Maranhense.

[**]Apoio financeiro.

[**]Fundação de Amparo à Pesquisa e Desenvolvimento Científico do Maranhão – FAPEMA.

ANALYSIS ON THE IMPLEMENTATION OF SCHISTOSOMIASIS CONTROL PROGRAM IN THE FAMILY HEALTH STRATEGY: A CASE STUDY IN COASTAL AND VULNERABLE TOWN IN PERNAMBUCO.

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ABSTRACT

Introduction: Since 1975 actions have been developed to control Schistosomiasis in endemic areas in Brazil, but despite the oficial program efforts, the disease is expanding throughout the country. In Pernambuco the disease is endemic in rural localities and is expanding to coastline communities. The Family Health Strategy is an important device to prevent and control the establishment of this disease in vulnerable areas. This work aim to know what factors influences the implementation degree of the Schistosomiasis Control Program (SCP) in the Serrambi Family Health Strategy, a vulnerable localitie for Schistosomiasis transmission, in Ipojuca city. Methods: To assess the implementation degree of the program activities we used the method known by "implementation analysis", which evaluated the influence of the context by theoretical framework of Carlos Matus. Structured questionnaires were used to interview the staffs of the local Schistosomiasis Control Program: the SCP Coordinator, the Primary Care Coordinator, the Health Secretary and the professionals members of Family Health Strategy. For additional information we consulted official documents. A points system was used to classify the implementation degree of the Schistosomiasis Control Program in Family Health Strategy: implemented (90 to 100 points), partially implemented (60 to 89 points) and not implemented (< 59). The influence of the context in the implementation degree was classified as incipient (when it reached less than 33% of the points), intermediate (when achieved between 33.3 and 66.6% of the points) and advanced (when it reached more than 66% of the points). Results: The implementation analysis highlighted: (1) the implementation degree of the Schistosomiasis Control Program in Serrambi Family Health Strategy was not implemented (49.86 points); (2) Ipojuca has an advanced management capabilities to this intervention (75% of points). Conclusion: The context analysis showed that Ipojuca has an advanced management to administer the SCP, however, the municipality has been inefficient in the implementation of intervention in the town of Serrambi, due to the government priorities actions in endemic areas. We concluded that the ineffectiveness of schistosomiasis control in Serrambi can contribute to expanding the endemic area of the state.

OP1-07

URBAN SCHISTOSOMIASIS TRANSMISSION: NEW EPIDEMIOLOGICAL SCENARIO IN THE FOREST ZONE OF PERNAMBUCO

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Schistosomiasis is considered a rural endemic disease in Pernambuco and from decades affected the population in the Zona da Mata of this state. Among the municipalities of the region, Vitória de Santo Antão stands out as one of the most endemic, once the agriculture is the economical feature of the locality, which facilitates contact of the population with permanent breeding sites of vector of this disease. However, a new transmission scenario has been brought about by frequent floods observed during rain periods, leading vectors to urban areas and facilitating the onset of new breeding sites, which together with the lack of sanitation, increases the chances of contact between the snail vector, the parasite and the population. Therefore, this study aims to determine the risk of urban transmission for schistosomiasis in Vitória de Santo Antão - PE. **Method:** The study was conducted in Vitória de Santo Antão, from August/2014 to April/2015. A malacological survey was conducted and all the water collections of the urban area were investigated for the presence of vector snail (*Biomphalaria*) and classified as breeding sites or schistosomiasis transmission foci. The species of snail was taxonomically identified. For the diagnosis of infection by *Schistosoma mansoni*, the snails were exposed to artificial lighting for the issuance of cercariae. Negative snails for this technique underwent to nested-PCR (molecular diagnosis). For construction of risk maps all breeding sites were georeferenced using a GPS. Spatial data were analyzed using TrackMaker and ArcGIS software. **Results:** It was identified 22 breeding sites of *B. straminea*, and a total of 1,050 snails were collected in ditches on the asphalted mean streets of the city which were contaminated by sewer. By the nested-PCR technique was identified two foci of schistosomiasis transmission. Based on spatial data analysis were identified two risk areas for schistosomiasis transmission. **Conclusion:** The results show that there are breeding sites of *B. straminea* and schistosomiasis transmission foci in the urban area of Vitória de Santo Antão, setting a new epidemiological scenario for transmission of this disease in areas where there was only the classical or rural transmission. There is a need to continue investigating these breeding sites, as they are potential foci of transmission of schistosomiasis, once the epidemiological environmental is ideal for the occurrence, maintenance and transmission of this disease.

MODELING EFFECTIVENESS OF DRUG ADMINISTRATION ON A POPULATION INFECTED WITH *SCHISTOSOMA MANSONI*

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Introduction: Schistosomiasis is one of the most important public health problems that affect human populations, especially those living in poorer regions, with low socioeconomic environment, without adequate sanitation and clean water. WHO recommends treatment without prior diagnosis of the most vulnerable individuals such as school children and adults in endemic areas. In Brazil treatment is based on the infection prevalence. In areas of low and medium prevalence treatment is given only for positive individuals and in situations where the prevalence is greater than 50% treatment is directed to the entire population. **Objective**: To develop a non-linear mathematical model to evaluate the effectiveness of mass treatment of a population infected with *S. mansoni*. **Methods**: The evolution of infected and non-infected persons with time was studied by building a 2-dimensional system of differential equations. We consider that a) children born without infection, b) the population is growing with a growth of logistical type, without having reached its maximum growth and c) once treated an individual will be free of infection unless it re-infects. **Results**: The population was divided into two strata: P0 (t), which corresponds to the number of uninfected persons in year (t) and P1 (t) and those corresponding to the number of infected people during the year (t). It was possible to develop a mathematical model, consisting of a system of differential equations that has in its domain, single global attractor. The 2-dimensional system has a unique global attractor where the number of infected persons is non-zero, due to the re-infection effect. It is proved that the model reached its equilibrium. **Conclusion**: The modeling results suggest that if the treatment is the only intervention in the population, that is, without additional Investments in better sanitation and health education programs, even treating the whole population or just those infected, the prevalence always will be around 10%. The model also suggests that in this way over time prevalence tends to always keep this level with few possibilities of spreading disease in the area.

Financial support: CAPES

It was proved that treatment alone cannot end the disease using the current treatment strategies. The mathematical modeling analysis shows that re-infection will always occur, by treating the whole population or just a part of it. Thus it is essential to eradicate all modes of re-infection in order to eliminate the disease. That is, whatever the treatment policy applied, there will always be cases of schistosomiasis. Our analysis reveals that even with continuous treatment a little over 9% of population will always be infected.

OP1-09

PREVALENCE OF *Schistosoma mansoni* IN PATIENTS TREATED IN CLINICAL LABORATORY ANALYSIS, LAC, STATE UNIVERSITY OF SANTANA BA-FAIR, THE PERIOD 2013 TO 1ST HALF OF 2015.

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Introduction: Several studies have reported a positive association between intestinal parasites and the health and socio-economic conditions in disadvantaged communities (Andreazzi et al., 2007). In this sense, it can be observed that the spread increases the incidence of parasitic diseases, mainly Schistosoma mansoni, by environmental change, high population density and poor hygiene and improper use of contaminated water that are favorable conditions for multiplication of the parasite with a population susceptible (Ferreira et al., 2006). This study aims to investigate the prevalence of S. mansoni in patients treated in the Clinical Analysis Laboratory (LAC) of the State University of Feira de Santana (UEFS). **Methods:** The research was conducted between the period 2013 to the 1st half of 2015 by applying parasitological method, sedimentation Candid. **Results:** 1,214 patients were examined, with an overall prevalence rate of 25.0% for intestinal parasites, and the 304 positive samples were only 3.3% for Schistosoma mansoni. The prevalence data are consistent with the literature, ratified by other studies the frequency of intestinal parasites with the sanitation conditions (Tietz MARQUES et al., 2005). The prevalence determined by LAC indicates a low occurrence of schistosomiasis in the study population, however, knowledge of the presence of species of snails of S. mansoni transmitters serves as a support to investigations aimed at clarifying the origin of the human cases diagnosed and reported from parasitological surveys or routine tests of basic health services, as well as those carried out by this laboratory. **Conclusion:** This diagnostic activity is very important because successive reporting human cases in a given locality or municipality, facilitates the discovery and combat the parasite outbreaks. Thus, it is suggested the implementation of public health policies to prevent its spread and the use of better diagnostic techniques to estimate the prevalence of schistosomiasis in a population.

Source of Financial Support: State University of Feira de Santana

OP1-10

MOLLUSCICIDE ACTIVITY OF *Lippia gracilis* ESSENTIAL OIL AGAINST SNAIL *Biomphalaria glabrata*.

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Introduction: The control of *Biomphalaria glabrata*, the intermediate host of *Schistosoma mansoni*, through molluscicides, is one of the ways to eradicate schistosomiasis. The search for products with high molluscicidal and biodegradable contents in the environment has encouraged the research of regional plants with these potentials. This study aimed to evaluate the molluscicidal potential of the *Lippia gracilis* essential oil as well as to evaluate its chemical composition in order to determinate the responsible constituents for this biological activity. **Methods:** The plant samples were collected in the Chapada das Mesas National Park - MA, Brazil. The permission for the collection of plants was provided by the Authorization and Information on Biodiversity System (no. 28007-2). The samples were identified and deposited in the João Murça Pires Herbarium at Emilio Goeldi Museum - PA. The essential oil was extracted by hydrodistillation and the chemical components of the oil were identified by GC-MS. The molluscicidal activity in *B. glabrata* followed the procedures recommended by the World Health Organization (1965). Ten snails were exposed to essential oil solution at concentrations of 300, 200 and 100 ppm for 24 hours. The dilutions were performed using DMSO 1%. In tests, positive (copper sulfate, 20 ppm) and negative (water and DMSO 1%) control were introduced. **Results:** The *L. gracilis* essential oil was considered active at all concentrations used, the snail death rates were 100%, which were confirmed by the observation of cephalopodal mass retracted inside the shell or release of hemolymph. At 300 ppm concentration, immediate death of snails with release of hemolymph was observed. The biocide action of this oil may be related to the presence of identified chemical constituents: thymol (24.21%), α-humulene (14.65%), β-caryophyllene (13.79%), linalool (6.81%), carvacrol (4.91%), and minor amounts of other terpenoids. The obtained results demonstrated that *L. gracilis* species have promising effect. According to the criteria established by Hostettmann et al. (1980), plant species are considered bioactive when they present 90% of lethal concentration at less than 400 ppm. According to WHO, the activity is considered significant if it obtains 90% of mortality at 100 ppm, for crude vegetable. The description of the chemical and biological activities of essential oils is important for the development of products of vegetable origin with molluscicidal activity.

[i] **Financial support:** Maranhão Foundation for the Protection of Research and Scientific and Technological Development – FAPEMA.

OP1-11

SCHISTOSOMIASIS MANSONI: COMPARATIVE ANALYSIS BETWEEN MALES AND FEMALES OF WILD RODENTS *Holochilus* sp. INFECTED IN THE LABORATORY

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Introduction: The schistosomiasis is one of the human parasite that most leads deaths worldwide, being extremely necessary the control. It's a disease whose the parasite here in Brazil has a cycle where trematode (*Schistosoma mansoni*) needs two hosts: the intermediate (snail *Biomphalaria* sp.) and the final (human). However, studies about the rodent *Holochilus* sp. found in the São Bento city - MA (endemic area), reaffirmed the importance of the maintenance of these rodent in the helminth cycle. **Objectives**: The proposed objective was to describe the manifestation of schistosomiasis in the rodent *Holochilus* sp. showing possible diferences between their sexes. **Methods**: The snails were collected in São Luís - MA and subjected to positivity tests for the presence of cercariae of *S. mansoni*, through the light and heat stimulus. Since rodents were used a group of animals born and raised in the laboratory. About 150 cercariae of the positive snails were used for infection of 20 rodents (10 of both sexes), and one of each sex was kept as control. After one month, these were subjected to triplicates of feces slides analysis through Kit Kato-Katz over 30 days. After that, they were sacrificed, their livers and intestines were taken for verification of adult worms. Then, thin slices of left lobe of each animal liver were intended for making histological slides. **Results:** As a result of the feces slides analysis, 62.5% of males eliminated eggs in their feces and earlier than the 10% of positive females to the test. However the adult worms were collected in larger quantities in females, contradicting perspectives found in the results of Kit Kato-Katz. As for the characterization of liver lesions, for males we got several areas of significant changes in the tissue caused by granulomas around the parasite egg and the adult worms themselves in intrahepatic branches. For females we observed more lesions limited to small regions of the hepatic parenchyma. **Conclusions:** From the results, it was quite clear that the females were more resistant both in the number of eliminated eggs and in the modulation of liver injury. It is quite valid cogitate the presence of mechanisms in a hormonal level existing in them that ease the pathogenicity of the disease. Thereby, further research around biochemical compounds present in these rodents may be alternatives for the control of disease in humans.

Apoio financeiro: Fundação de Amparo à Pesquisa e ao Desenvolvimento Científico e Tecnológico do Maranhão - FAPEMA

OP1-12

A DESCRIPTIVE STUDY OF BASIC SANITATION CONDITIONS IN HYPERENDEMICS AREAS FOR SCHISTOSOMIASIS IN PERNAMBUCO, BRAZIL, 2012.

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INTRODUCTION: Schistosomiasis is being successfully controlled in many countries but remains a major public health problem, with an estimated 9000 people infected, mostly in Pernambuco state. Few countries in this region have undertaken successful and sustainable control programmes. The construction of water schemes to meet the power and agricultural requirements for development have lead to increasing transmission, especially of Schistosoma mansoni. Increasing population and movement have contributed to increased transmission and introduction of schistosomiasis to new areas. Reducing the prevalence of schistosomiasis in hyperendemic areas of the Pernambuco state has been one of the main strategy of the SANAR-Neglected Diseases Program. Besides actions regarding epidemiological surveillance, SANAR has performed an analysis of the sanitation conditions in 119 locations that had an average prevalence for schistosomiasis above 10%. This study aims to characterize the hyperendemic locations for schistosomiasis in Pernambuco regarding sanitation conditions and to recommend environmental intervention measures that favor the sustainability of actions to face the disease. **METHODS:** This is a descriptive epidemiological study using the data obtained in the "Report of the sanitation conditions of the hyperendemic locations for schistosomiasis in Pernambuco", developed by the Health Surveillance Secretariat of the Pernambuco state in 2012. **RESULTS**: The report was made available for all municipal and state managers and was the base for this analysis. Among the 119 hyperendemic locations, 72 (60.5%) reported the absence of piped water through a public network. 110 (92.4%) reported lack of sewage collection and 116 (97.5%), no sewage treatment. **CONCLUSION:** The hyperendemic locations showed poor sanitation conditions, which strengthens the link with the high schistosomiasis prevalence; therefore, it is necessary to raise awareness among municipal managers regarding effective actions of sanitary improvements to guarantee the sustainability of schistosomiasis control.

Funding sources: Secretariat of Health of the State of Pernambuco

COMPUTATIONAL EPIDEMIOLOGY APPLIED ON ENVIRONMENTAL ANALYSIS FOR SCHISTOSOMIASIS TRANSMISSION

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ABSTRACT

Epidemiologists and computer scientists are developing new data-driven, high-performance-computing-powered inference engines to model the socioeconomic context and strategies necessary to counter disease outbreaks. Mathematical epidemiology has traditionally relied on rate-based differential-equation models. In this approach, researchers partition a population into subgroups based on various criteria, such as demographic characteristics and disease states, and use the models to describe disease dynamics across these groups. This approach has been successful in informing public health policy. Nevertheless, a potential weakness is its inability to capture the complexity of human interaction and behavior. Effective epidemiology is not just about prediction, but also about anticipation and adaptation. An alternative approach uses agent-based models as part of the predictive filter for situation assessment. We have developed one such Computational Epidemiology approach that uses Cellular Automata. Computational epidemiology is an interdisciplinary area setting its sights on developing and using computer models to understand and control the spatiotemporal diffusion of disease through populations. The models may range from descriptive, for example, static estimates of correlations within large databases, to generative, for example, computing the spread of disease via person-to-person interactions through a large population. This work presents an environmental analysis for snail behavior when in different rainfall rates. The model is based on a SI (Susceptible-Infected) model of differential equations and a Cellular Automata computational machine. The computational simulations answer questions like: In a rainfall above the standard rate, what will happen to the snails and what is the power of that into the influence on environmental infectivity? And in the same condition of high rainfall, as it can enhance environmental infectivity (tanks will also contact the breeding)?

OP1-14

PREVALENCE OF *Schistosoma mansoni* IN MICRO AREAS URBAN SANTANA FAIR, BAHIA THE PERIOD 2012 2015 (1ST HALF).

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Introduction: Schistosomiasis still constitutes a serious health problem, killing mostly young adults of large geographic areas of the Northeast. Control of Schistosomiasis is one of the most difficult tasks of Public Health services. The importance of the disease is not restricted to the geographic distribution, but to escape the clam forward mechanism to molluscicide, poor housing conditions and sanitation, economic activities linked to the use of water - mainly in rural and peri-urban areas also by lack of continuity of control actions and adherence to health education programs for the population. (NEVES, 2001). This study aimed to survey the prevalence of *S.mansoni* population of 3 peripheral micro areas associated with the socioeconomic profile of the population and environmental conditions in the Mangabeira neighborhood in Feira de Santana, Bahia. **Methodology:** To survey the epidemiological profile of the population and area, were applied individual and family forms, and the Statement of Consent signed by the head of household. For identification of the parasite was performed stool test by the method of spontaneous sedimentation and Kato-Katz in the population for the survey of *Schistosoma mansoni*. **Results:** The study included 98 families and the positivity percentage for *S. mansoni* was 2.5%. The prevalence of infection by intestinal parasites is one of the best indicators of socioeconomic status of a population and can be associated with several determinants such as inadequate sanitation facilities. **Conclusion:** Thus, it was found that the positivity rate for schistosomiasis can be associated with the presence of streams and ponds that serve as breeding grounds for intermediate hosts such as environmental conditions present in the local housing and social life, where it becomes necessary community engagement for deployment, development and success of control programs.

Source of Financial Support: State University of Feira de Santana

Source of Financial Support: State University of Feira de Santana

OP1-15

ENVIRONMENTAL RISK FOR THE SCHISTOSOMIASIS TRANSMISSION ON THE FORTE ORANGE BEACH, ITAMARACÁ, PERNAMBUCO

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INTRODUCTION:

Studies on the update of the epidemiological and environmental landscape that maintain active the schistosomiasis transmission in the locality Forte Orange Beach, Itamaracá, Pernambuco, are relevant considering the recent introduction of another intermediate host snail disease in the locality. OBJECTIVE: map the breeding sites and schistosomiasis foci and collect environmental data to identify areas with higher risk of transmission. METHODS: the mapping of the area was carried out by the software ArcGIS 10.1 - with blocks vectorization and satellite images - resulting in the georeferenced sketch of the locality. The breeding sites were selected by epidemiological criteria and the snails were captured by systematic sampling effort as described by OLIVER e SCHNEIDERMAN (1956). The identification of the snails species was performed by the dissection of the genital system (DESLANDES, 1951) using 10% of all collected snails. It was verified the emission of *S. mansoni* cercariae by host snails using the light exposure technique (SOUZA ET AL., 1990)

and the molecular diagnosis using Nested PCR (ABATH, 2000) to identify the DNA of the parasite in the molluscs. For the environmental conditions diagnosis were collected data of temperature, pH and salinity and Kernel spatial analysis identified clusters with higher risk transmission (BAILEY; GATRELL, 1995). RESULTS: This study identified 16 breeding sites and 12 foci distributed around residences and hostels and 93% of the breeding sites are of *Biomphalaria straminea.* The greatest number of snails (1.725) was observed in the rainy season and the spatial analysis maps show environmental and biological risk in the different climatic seasons. The highest temperature recorded in breeding sites was 41 °C and the pH ranges were between 6.9 and 11.1. This data shows that the snails are surviving in extreme climatic conditions as opposed to the literature data.

Keywords: Schistosomiasis, Epidemiology, Physicochemical Analysis, Spatial Analysis.

OP1-16

EVOLUTION OF SCHISTOSOMIASIS INFECTION RATES IN IPOJUCA, PERNAMBUCO.

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Schistosomiasis mansoni is historically endemic in Ipojuca, Pernambuco, with localities maintaining high rates of human infection (SANAR 2013). In this municipality it has been observed the expansion of the disease for coastal areas with great tourist influx, such as Porto de Galinhas and Serrambi (GOMES et al 2012; BARBOSA et al 2015). The objective of this research was to analyze the parasitological data - provided by Ipojuca health services - as a result of local surveys conducted in the last eight years. METHODS AND RESULTS: Data is collected from reports provided by the municipality, resulting from census surveys for schistosomiais in several localities over the period 2007 - 2011. Data is being analyzed by the statistical program Excel including the variables: name, gender, age, positivity and parasitic load to *S.mansoni. T*he base denominator is the number of people per location. Until the present time were analyzed 10 localities with 1,642 people examined. In 2007-2008 the localities with the highest rate of *S. mansoni* were: Engenho Pará I (63.3%), Engenho Pará II (53.5%), Engenho Mauá (34.3%). In 2011 these localities were sampled again revealing decrease in infectivity rates: 47.2%, 32.9%, 15.1% respectively, with parasite load average of 100 OPG. CONCLUSION: Despite the specific decrease in infection rates for *S. mansoni* in the 03 hyperendemic communities, the overall percentage decline for all locations was from 16.7% (2007/2008) to 15.6% (2011), results without statistical significance. These fees are responsible for maintaining the disease transmission and it is known that the evolution to severe forms of schistosomiasis is associated with the intensity and duration of infection. The discontinued drug action, dissociated from health improvements, it is not enough to reduce the prevalence of schistosomiasis in the communities affected by this injury.

Keywords: schistosomiasis, epidemiology, Ipojuca, neglected diseases, basic sanitation.

OP1-17

THE USE OF SIG IN ENVIRONMENTAL STUDY ON THE OCCURRENCE OF SCHISTOSOMIASIS IN ITAMARACÁ ISLAND, PERNAMBUCO

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ABSTRACT

Introduction: Studies in the Pernambuco coast shows human cases with acute clinical form of schistosomiasis and snail foci with 31% of infection rates. The present research aims to diagnose risk environments for schistosomiasis transmission in a locality of Pernambuco coast, using GIS techniques. **Methods:** The study was conducted at the Forte Orange Beach, Itamaracá Island, Pernambuco. Parasitological survey was conducted in the population served by the Family Health Unit Program using Kato Katz method. The collection sites of snails hosts were georeferenced and *Biomphalaria* were collected by the Oliver and Schneiderman technique. *Biomphalaria* species were identified through Dissection of Genital System and the observation of *Schistosoma mansoni* infection was performed by exposure to light and PCR technique. The sketch of the locality was built by vectorization of images obtained in Google Earth and for the spatial location of households and breeding sites/focus a GPS receiver was used. To identify areas with positive human clusters and breeding sites of vectors was used estimator of kernel intensity with spatial resolution (x, y) of 10 meters and with τ = 250 m. A digital elevation model (DEM) was obtained from the Shuttle Radar Topography Mission and the map away was obtained through Euclidean Buffer. **Results:** The parasitological survey identified 4.3% *S. mansoni* cases for a total of 1,604 local residents examined. From 28 breeding sites identifying in the locality, 02 are *B. glabrata* and 26 *B. straminea*, of which 12 were with infected snails. The kernel and digital elevation maps showed the *Biomphalaria* focus and human schistosomiasis cases were concentrated on the lower ground locations. The distance map shows the proximity of host snails focus in relation to schools and health units, places where the local population moves every day. **Conclusion:** The GIS is an important tool that can help health services to monitor the disease in hazardous environments.

Financial support: Science and Technology Support Foundation of the State of Pernambuco (FACEPE) and Brazil Without Misery Program (MS).

OP2-02

ULTRASTRUCTURAL EVALUATION OF SCHISTOSOMA MANSONI WORMS TREATED WITH PHTHALYL-THIAZOLE LPQM-48

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Introduction: Schistosomiasis is a chronic and debilitating disease caused by worms of the genus *Schistosoma*. It remains a major neglected poverty-related health problem in many tropical areas. The only drug available for treating schistosomiasis is praziquantel (PZQ), although PZQ has proven efficacy, there is a need to develop new drugs as schistosomicides since studies have shown that repeated use of this drug in areas of endemicity may cause a temporary reduction in efficacy (1,2,3). In this context, the phthalimides and derivatives of cyclic thiosemicarbazones are promising molecules, demonstrating a broad pharmacological profile and constituting an important class of compounds whose properties have been extensively studied in the medicinal chemistry (4).

Methodology: Swiss mice, infected with 120 cercariaes, were submitted to perfusion fifty-five days post infection for the recovery of worms. The parasites obtained were incubated with the compound LpQM/SC-48 (concentration range of 5-100 μg/mL) in culture dish containing complete RPMI medium at 37 °C in a humidified atmosphere suplemented 5% CO_2 gas for a period of 192h. Each concentration was tested in three wells, the first well received four females, the second well received four males and the third well received two pairs of worms. For ultrastructural study, samples of *Schistosoma* incubated with 100 μg/mL of compound for 6h and 10h were analyzed by means of Scanning electron microscopy using method described in ref. 5.

Results: The worms treated with the compound showed 100% mortality in the dose of 100 μg/mL in the first period of observation (24h). The ultrastructural study revealed severe damage of the tegument with peeling and exposure of sub integumental tissue and disruption of some tubercules with 6 hours of exposure. After 10h of exposure the integumental of worms was strongly damaged, with an increasing number of tubercles completely destructed, and disintegration of the tegument in the same areas.

Conclusion: The present results suggest that the compound LpQM/SC-48 have antischistosomal activities with significant changes in the worm's integument and provide a basis for subsequent experimental and clinical trials.

Acknowledgements: FIOCRUZ and CNPq for financial support and scholarships.

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Acknowledgements: FIOCRUZ and CNPq for financial support and scholarships.

"EF-24: A CURCUMIN ANALOG WITH ACTIVITY IN VITRO AGAINST *Schistosoma mansoni* ADULT WORMS¨

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Introduction: Schistosomiasis, a chronic debilitating disease caused by trematode worms of the genus *Schistosoma*, affects 200 million people in tropical and subtropical regions causing more than 280,000 deaths per year. Praziquantel (PZQ) is the drug available for the treatment of schistosomiasis. However, the existence of strains less sensitive to PZQ reinforces the need to develop new safe and effective schistosomicidal drugs. Curcumin is the major constituent in the rhizome of *Curcuma longa* and exhibit *in vitro* and *in vivo* schistosomicidal activities. In addition, studies have shown that derivates and analogs of curcumin display a better biological activity than the original molecule. Objective: The aim of this work was to evaluate the activity of EF-24 against *Schistosoma mansoni in vitro*. Methodology: Adult worms couples were recovered by perfusion of mice infected, cultivated in RPMI 1640 medium with different concentrations of EF-24 during 6, 12 and 24 hours and the viability was analyzed using inverted microscopic. The morphology of adult worm couples was analyzed by transmission electronic microscopy and the anion superoxide production was evaluated using *Nitro Blue Tetrazolium method*. Results: The results showed that EF-24 caused a reduction on the viability of adult worms with LC_{50} values of 50,22μM, 14,92μM, 9,60μM at 6, 12 and 24 hours, respectively. Adult worm couples treated at concentration 9.60 μM of EF-24 at 12 and 24 hours showed morphological alterations such as vacuoles formation, swelling and disruption of mitochondrial membrane and chromatin condensation. In addition, alterations of the tegument of male and female worms were observed. The results also showed an increase in the anion superoxide production in male worms. Conclusion: In summary, our results indicate that EF-24 possesses *in vitro* schistosomicidal activity against *S. mansoni*. It is also important to emphasize that, considering the obtained results, further biological studies are in progress in order to elucidate its mechanism(s) of schistosomicidal action.

Financial support: (Process 2013/11164-4, 2014/02018-7, 2015/01394-8).

OP2-04

PREVALENCE OF PSEUDOTROMBOCYTOPENIA IN PATIENTS WITH HEPATOSPLENIC SCHISTOSOMIASIS MANSONI

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Introduction: Pseudothompocytopenia (PTP) is a technical artefact generated by pre-analytical errors(collection, transportation, packaging, temperature and employed anticoagulants chemical composition) that reduces sample quality in automated blood analysis. PTP is due to antigenic exposure of glycoprotein IIb/IIIa to ethylene-dinitro-tetraacetic acid (EDTA). Patients with normal platelet counts and pseudotrombocytopenia may be subject to iatrogenic therapeutic and diagnostic investigation, such as, corticosteroids therapy, bone marrow puncture and platelet concentrate transfusion or splenectomy. Presently PTP patients often don't receive adequate surgical treatment because surgeons are not aware of the presence of a false low platelet count. Patients with hepatosplenic form of schistosomiasis (HSS) cannot be subject to invasive procedures that in many cases would be the best treatment option, because they have apparent low platelet count. Our aims were to determine the prevalence of Pseudothompocytopenia in patients with hepatosplenic form of schistosomiasis.

Methods and Results: We investigated PTP prevalence in this group of patients performing a clinical-laboratory cross sectional study examining blood samples of patients with HSS and controls. We selected 136 volunteers, being 67 with HSS and 67 without the disease. The test consisted in platelet counting using *Fonio* indirect method (microscopic counting) in anticoagulant-free sample and automated platelet count using EDTA as anticoagulant in whole blood sample at

times 20 and 180 minutes after collection, and simultaneously we performed the above procedure by changing the anticoagulant to sodium citrate. We found platelet clumps in 7.5% of HSS patients and none of the controls without HSS ($p=0.05$). Contrary to what the clinical and laboratory practice and guidelines suggests, PTP prevalence in anticoagulated samples with sodium citrate was 19.4% in HSS patients and 9.0 % in the group without HSS ($p<0.01$). **Conclusion:** The prevalence of PTP in patients with HSS is worse than currently believed and made worse by sodium citrate, the alternative anticoagulant.

Financial support: FAPEMIG, CAPES, CNPq.

OP2-05

THE ROLE OF NEW DIAGNOSTIC TECHNIQUES IN THE CONTROL OF SCHISTOSOMIASIS MANSONI IN LOW TRANSMISSION AREAS

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INTRODUCTION: The Kato-Katz technique is recommended by WHO for the diagnosis of schistosomiasis mansoni. However, the sensitivity of this technique decreases in individuals with low parasite burden and in the assessment of cure. METHODS: This study was realized in Tabuas and Estreito de Miralta communities, located in the schistosomiasis endemic area of the Montes Claros municipality, Minas Gerais state, Brazil. One fecal sample was obtained from all participants, and analyzed according to the Kato-Katz (KK) (24 slides = 1000 mg) and the Saline Gradient (SG) technique (2 portions of 500 mg = 1000 mg of feces). The PCR-ELISA and qPCR assays were also applied in 1000 mg of feces. All positive individuals for *S. mansoni* or other helminths were treated with praziquantel or albendazol, respectively. For cure evaluation, samples from individuals treated were collected 30, 90 and 180 days after therapeutic intervention and examined by parasitological and molecular techniques. RESULTS: In Tabuas, the positivity obtained by the analysis of two and 24 KK slides were 15.5% (23/148) and 20.9% (31/148) respectively, both lower than that obtained by SG technique, 29.0% (43/148) ($p< 0.05$). The prevalence obtained by the combination of the parasitological techniques was 31.0% (46/148). By the PCR-ELISA, the positivity was 25.0% (37/148), also lower than that obtained by the qPCR, 30.4% (45/148) ($p< 0.05$). In Estreito de Miralta, the SG and the qPCR showed the same positivity rate, 18.3% (26/142) and by the KK technique (24 slides) the positivity was 19.7% (28/142), no statistical difference was detected ($p= 0.802$). The prevalence obtained by the parasitological techniques was 24.6% (35/142). The cure rates obtained by the KK and SG 30, 90 and 180 days after treatment in the Tabuas locality, were 100%, 91.6% and 78.4%, respectively. By the PCR-ELISA assay, the cure rates were 89.7%, 88.8% e 67.5% and by the qPCR assay were 100%, 83.3% and 62.1% in the same followed-up steps. In Estreito de Miralta, the cure rates obtained by KK and SG were 93.3%, 96.9% e 96.5% (30, 90 and 180 after treatment, respectively) and by the qPCR the cure rates were 93.3%, 93.9% e 96.5% in the same followed-up steps. CONCLUSION: This study reinforces the need of combining techniques to improve the diagnosis accuracy, increasing from this way the detection of individuals with low parasite burden and for the cure assessment, as an important tool for disease transmission control.

SUPPORT: CAPES; DECIT / CNPq; FIOCRUZ.

OP2-06

SCHISTOSOMA MANSONI INFECTION DIAGNOSIS IN A LOW ENDEMIC AREA IN NORTHEAST BRAZIL USING FOUR DIFFERENT METHODS

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INTRODUCTION: *S. mansoni* infection diagnosis is traditionally performed by the Kato-Katz technique (KK). However, the sharp decrease of sensitivity in low endemic areas becomes a limitation. Techniques based on Polymerase Chain Reaction (PCR) have been considered potentially valuable as a complementary tool in the diagnosis of schistosomiasis. Another promising approach is the detection of parasite-derived circulating antigens. A lateral flow strip immunoassay for the detection of Circulating Cathodic Antigen (CCA) in urine was developed into a commercially available rapid Point-of Care test (POC-CCA). However, its evaluation in low endemic areas is still needed. The aim of this study was to determine the positivity rates according to KK method, PCR technique, POC-CCA test and ELISA-SWAP for diagnosis of *S. mansoni* infection in a low endemic area. METHODS: The study was conducted in Bananeiras village, Capistrano, Ceará, Brazil. PCR technique was done in stool samples, POC-CCA test in urine samples and ELISA-SWAP in serum samples from 50 individuals selected by simple random sampling, including four individuals with previous positive results by KK. RESULTS: The study group consisted of 21 males (42%) and 29 female (58%) with a median age of 20.5 years. Of these, 30 (60%) were ELISA-reactive and 20 (40%) non-reactive. Using the three methods for diagnosis of *S. mansoni* active infection, 14 individuals (28%) were considered positive: 4 (8%) positive in KK, 12 (24%) in PCR and 1 (2%) in the POC-CCA. In the POC-CCA, however, 12 (24%) subjects showed result categorized as 'trace' (very light lines). CONCLUSION: PCR technique demonstrated as an important tool in the diagnosis of *S. mansoni* infection in low endemic areas. The POC-CCA needs to be further evaluated in these areas. Considering 'traces' as positive (t+), the POC-CCA positivity rates are superior to the KK, but these 'trace' signals due to visual reading promote fail in the results interpretation. These results are preliminary and studies with large populationare required to evaluate this test.

OP2-07

USE OF POINT-OF-CARE PLATFORM TO DETECT CIRCULATING CATHODIC ANTIGEN (POC-CCA) IN LOW ENDEMIC AREA: LONG TERM FOLLOW UP POST - PRAZIQUANTEL (PZQ) TREATMENT.

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Introduction: Point-of-care circulating cathodic antigen platforms (POC-CCA) to detect *Schistosoma mansoni* antigens have been considered a promising alternative to Kato-Katz (KK) test in areas of high/moderate endemicity. Although POC-CCA showed a higher sensitivity than KK, its accuracy in diagnosis of active infection and assessment of therapy response in low endemic areas must be further investigated. The aim of this study is to evaluate POC-CCA performance in a long-term follow up post chemotherapy use in a low endemic area. **Methods:** Study population included 102 individuals (being 57.84% female and mean age = 28 ± 17,28 years) from a rural area of Rio de Janeiro, Brazil. After signing informed consents (study approved by HUCFF/UFRJ Ethics Committee, n°058/09), enrolled individuals provided blood, urine and fecal samples. Active *Schistosoma mansoni* infection was established by detection of eggs in KK (two slides/stool sample, K-K) and DNA amplification by real-time PCR (primers targeting the cytochrome c oxidase 1) in feces. For CCA detection, urine samples were tested by POC-CCA cassette (Rapid Medical Diagnostics, Pretoria, South Africa). Statistical analysis was performed by using Stata version13 (College Station, Tx). Actively infected individuals were treated with PZQ (40mg/kg) and reevaluated in 4-6, > 6-12 and >12 – 15 months (mo) post-treatment. Responders to therapy were defined as KK and/or PCR negative.**Results**: During 15 mo follow up, 25 out of 27 individuals with active infection agreed to be monitored post PZQ use. Results showed that ≤ 6mo post chemotherapy, 7 out of 14 responders still presented antigen reactivity (mostly weak reactivity or “trace”). Cure rates determined by KK/PCR and POC-CCA were 87.6% and 56.25%, respectively. Nonetheless, > 14 mo post therapy, antigen detection decreased among responders (2 /10). And cure rates were 100% as determined by KK/PCR and 80%, by POC-CCA. In 6 individuals with continuous re-exposure in the 15 mo interval, no reactivity in POC-CCA was observed after multiple episodes of re-infection. **Conclusions**: POC-CCA is an unsuitable

marker of drug response when used in low endemic area. In long-term follow up, POC-CCA fails to detect cases of active infection post-reinfection. POC-CCA is still a controversial strategy to be used as a tool for monitoring drug efficacy in low endemic areas.

Financial Support: FAPERJ.

THE ROLE OF EFFLUX PUMPS IN *SCHISTOSOMA MANSONI* PRAZIQUANTEL RESISTANT PHENOTYPE

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Abstract

Introduction: Praziquantel (PZQ) is the drug of choice in the treatment of schistosomiasis due to its high cure rates and no significant side effects. However, in the last years there has been an increase in the number of cases of tolerance to PZQ, which has caused growing concerns regarding the emergency of resistance to this drug.

Other studies report that drug resistance in helminths might involve efflux pumps such as members of ATP-binding cassette transport proteins, including P-glycoprotein and multidrug resistance-associated proteins families.

Methodology and Results: In our laboratory, we selected a parasitic line of *S. mansoni*, through constant drug pressure over several cycles, which was resistant to 1200 mg/kg PZQ. To evaluate the role of efflux pumps in PZQ resistance we compared the efflux pumps activity in the susceptible and resistant strains through an ethidium bromide accumulation assay in the presence and absence of Verapamil.

The role of efflux pumps in resistance to PZQ was further investigated comparing the response of the parasites of the susceptible and resistant strain to PZQ in the absence and presence of different doses of Verapamil, in an *ex vivo* assay.

The *ex vivo* assay showed a higher lethal dose of PZQ in the resistant strain in the absence of Verapamil. In the presence of Verapamil there was a decrease in the lethal dose of PZQ in males of both strains. Females did not show significant changes of lethal dose of PZQ in the presence of inhibitor. These results were corroborated by the observation of the levels of *SmMDR2* gene (coding for P-gp) in both isogenic strains by Real-time PCR (qPCR), were the males of the resistant strain showed the highest expression levels and by an increase of gene expression after exposure to PZQ in males of both strains.

Conclusions: Our results strongly suggest the involvement of Pgp-like transporters SMDR2 in Praziquantel drug resistance in *S. mansoni* males. Low doses of Verapamil successfully reverted drug resistance. Our results might give an indication that a combination therapy with PZQ and natural or synthetic Pgp modulators can be an effective strategy for alternative treatment of confirmed cases of resistance to PZQ in *S. mansoni*.

Key-words: *Schistosoma mansoni;* Drug resistance; Glycoproteins-P; Praziquantel

Funding

Tiago Mendes, António Pinto-Almeida, Silvana Belo and Ana Afonso were supported by Portuguese Foundation for Science and Technology (PEst-OE/SAU/UI0074/2014).

Tiago Mendes would like to thank CAPES PhD program for funding.

António Pinto-Almeida would like to thank the G.A.B.B.A. program and the Portuguese Foundation for Science and Technology for funding (SFRH/BD/51697/2011).

Emanuel Carrilho and Ana Afonso are supported by CNPq 400168/2013-8 and CNPq 375781/2013-7.

DIC, a 4,5-dihydroisoxazole derivative, as a potential compound to modulate the Schistosoma granuloma formation and the liver fibrosis by act inhibiting HMGB1 release.

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Schistosomiasis is a chronic disease caused by *Schistosoma mansoni*. The disease remains a major,neglected, poverty-related health problem in many tropical areas. The pathology associated with schistosomiasis is largely attributed to the intense granulomatous inflammations and subsequent fibrosis induced by parasite eggs that become trapped in the liver. Granuloma formation is dependent on $CD4^+$ T cell responses. Considering that the potent inflammatory response is mediated by pro-inflammatory cytokines, the use of drugs that act by modulating the inflammatory response could offer an alternative strategic to the treatment of schistosomiasis. The compound 3-(3-chloro-phenyl)-5-(4-pyridyl)-4,5-dihydroisoxazole, named DIC, is a five-membered heterocyclic compound with broad anti-inflammatory activity, in particular, acts by inhibiting the release of High Mobility Group Box-1 (HMGB1) proteins. The increase of HMGB1 serum levels occupies a central role in the pathogenesis of various inflammatory chronic diseases. Thus, in this work we investigated the effect of DIC in mice with schistosomiasis. The treatment with DIC (10 mg/kg/day) not only decreased cellular infiltration around the eggs deposited in the liver, but also reduced the granuloma collagen, likely by the drastic declined of IL-13 levels in the serum and liver. Importantly, we showed for the first time that HMGB1 serum levels were significantly increased in infected mice and that DIC treatment reduced these levels. Our data also suggested that the increase of HMGB1 in schistosomiasis is involved in the process of liver fibrosis. The compound DIC seems to be an important modulator of liver fibrosis in schistosomiasis and can therefore, be thought as a promising therapeutic agent.

Key words: 4,5-diidroisoxazol, schistosomiasis, liver fibrosis

DIC, A NEW 4,5-DIHYDROISOXAZOLE DERIVATIVE, AS A POTENTIAL COMPOUND TO MODULATE THE SCHISTOSOMAL GRANULOMA FORMATION AND LIVER FIBROSIS

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INTRODUCTION. Schistosomiasis is a chronic disease caused by Schistosoma. The disease remains a major, neglected, poverty-related health problem in many tropical areas. The pathology associated with schistosomiasis is attributed to the granulomatous inflammations and subsequent fibrosis induced by parasite eggs that become trapped in the liver. Considering that the potent inflammatory response in granuloma is mediated by pro-inflammatory cytokines, the use of drugs that act by modulating the inflammatory response could offer an alternative strategic to the treatment of schistosomiasis. The compound 3-(3-chloro-phenyl)-5-(4-pyridyl)-4,5-dihydroisoxazole (DIC) is a compound with broad anti-inflammatory activity, in particular, acts by inhibiting the release of High Mobility Group Box-1 (HMGB1) proteins. The increase of HMGB1 serum levels occupies a central role in the pathogenesis of inflammatory chronic diseases. Thus, in this work we investigated the effect of DIC in mice with schistosomiasis and also analyzed the role of HMGB1 as an inflammatory mediator in schistosomiasis. **MATERIAL AND METHODS:** The cytokines levels were determined by CBA. Liver sections were stained with HE and picro-sirius for granuloma size and collagen analysis respectively. **RESULTS AND DISCUSSION.** The treatment with DIC (10 mg/kg/day) not only decreased cellular infiltration around the eggs deposited in the liver, but also reduced the granuloma collagen, likely by the drastic declined of IL-13 levels in the serum. Cytokines as INF-Ɣ, IL-10, IL-6, IL-5, IL-4 and IL-17 have its levels decreased in mice with schistosomiasis and treated with DIC. Importantly, we found for the first time that HMGB1 serum levels are increased in human with chronic schistosomiasis. Our data also suggest that the levels of HMGB1 are increased in mice and DIC contribute for its downmodulation. **CONCLUSIONS.** The compound DIC seems to be an important modulator of liver fibrosis and can therefore, be thought as a promising drug to use concomitantly with praziquantel as an alternative for the treatment of schistosomiasis.

Keywords: 4,5-diidroisoxazol, schistosomal granuloma, liver fibrosis
Acknowledgments: FAPERJ and CNPq

OP2-11

SCHISTOSOMIASIS MORBIDITY IN TREATED PATIENTS AT THE HOSPITAL DAS CLÍNICAS, UNIVERSIDADE FEDERAL DE PERNAMBUCO

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Hepatic periportal fibrosis (PPF) is often observed in different intensity levels in chronic schistosomiasis patients. Approximately 2-8% of these patients may progress to more severe forms of PPF, with hepatosplenomegaly, ascites, upper digestive hemorrhage (UDH) and pulmonary arterial hypertension (PAH), which in some cases may lead to death. The most effective method for the PPF diagnosis is ultrasonography (US) in which is currently used in Niamey´s classification, recommended by the World Health Organization. According to this classification, the different PPF patterns are categorized as: A (normal liver); B (questionable fibrosis); C (peripheral fibrosis); D (central fibrosis); E (advanced fibrosis) and F (very advanced fibrosis). Hence, the aim of this study was to evaluate the schistosomiasis morbidity through the morbidity frequency factors such as UDH, PAH, ascites, and splenectomy in patients with different PPF standards diagnosed by US. The 771 patients treated at the Schistosomiasis Clinic at the Hospital das Clínicas, Universidade Federal de Pernambuco were assessed. From the total of patients evaluated, 15 had standard A (1.94%), 6 had standard B (0.77%), 56 had standard C (7.26%), 260 had standard D (33.72%), 377 had standard E (48.89%) and 57 had standard F (7.39%). Of these, 38.65% were men, with a mean age of 56.3 years and

61.34% were women with an average age of 57.7 years. Among the 771 patients evaluated, the morbidity distribution factors were: UDH 36.3%, 14.1% PAH, ascites 6.8% and 32.4% splenectomy. Most patients with the factors described above were advanced standards PPF, using US, to evaluate the PPF evolution. Which 29% had reduced PPF, 18.9% increased and 51.76% remained unchanged. It has been established that PPF may regress, even in patients over 50 years of age. It is noteworthy that Hospital das Clinicas, Universidade Federal de Pernambuco is a referral hospital for schistosomiasis. Hence, it receives patients with severe forms of the disease from endemic areas throughout the State of Pernambuco. This explains the high frequency of severe clinical forms and morbidity factors observed in patients evaluated in this study.

Financial Support: FACEPE

OP2-12

TREATMENT WITH PRAZIQUANTEL IN *Schistosoma mansoni* RESISTANT STRAIN DURING THE DEVELOPMENTAL STAGES ON VERTEBRATE HOST

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Introduction: The initial stage of development (immature worms) *Schistosoma mansoni* is less susceptible to PZQ. Perhaps, relative lack of efficacy of praziquantel (PZQ) in endemic areas could be due to juvenile worms at the moment of treatment. Nevertheless, it is possible that residual parasites or a portion of them after treatment could be a population of adult worms resistant to the drug, mainly in areas submitted to successive treatments. Our group obtained a resistant isolate (LE-PZQ) that was produced by use of drug pressure on infected *Biomphalaria glabrata*. LE-PZQ is 5x more resistant than the unselected parasite population (LE). The aim of this work was detect differences between LE-PZQ and LE in different stages of *S. mansoni* after treatment with PZQ. Methods and Results: Mice were infected with 100 (±10) cercariae from LE-PZQ or LE strain and treated with 400mg/kg PZQ on days 2, 6, 16, 23 and 45 after infection. Seventy five days after infection, mice were perfused for assessment of the parasite burden. Statistical analyses were performed comparing the mean of worms recovered from the mice infected with the LE and LE-PZQ strains treated in different periods. When we compared LE and LE-PZQ treated in the same period, it was observed significative differences on days 16, 23 and 45 post infection. The reductions of worms in LE strain were 39.3% (19.7±11.2), 53.1% (15.2±10.5) and 93.5% (2.11±1.9), respectively. Whereas, in the LE-PZQ strain, on 16, 23 and 45 days post infection the reduction of worms was 10% (31.73±7.0), 31.42% (23.90±5.8) and 66.5% (11.78±4.2), respectively. When we compared LE-PZQ and LE treated on day 45 after infection, LE-PZQ was 5.5x more resistant than the susceptible strain. Conclusion: The results demonstrated that LE-PZQ has been maintained resistant and permitted to infer that the resistance could begin around 16 days post infection.

PROEP/FIOCRUZ; CNPq

OP2-13

QUALITY OF LIFE OF INDIVIDUALS WITH HEPATOSPLENIC SCHISTOSOMIASIS AND SCHISTOSOMIASIS MYELORADICULOPATHY

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Introduction: Schistosomiasis mansoni is a debilitating parasitic disease highly prevalent in tropical and subtropical regions of the world. It is considered a serious public health problem because of its high morbidity rate. In the literature, there is scare information on schistosomiasis to identify, map and quantify the impact of this disease. The objective of this study was to assess quality of life related to health of patients with mansonic hepatosplenic schistosomiasis (HSS) and schistosomal myeloradiculopathy (SMR). **Methods and Results:** Volunteers were admitted at the clinic of infectious and parasitic diseases of the Hospital das Clínicas/UFMG (CTR/Orestes Diniz) from July to October 2014. We interviewed 97 people: 49 with hepatosplenic schistosomiasis, 22 with SMR and 26 without schistosomiasis (control group). All participants completed the questionnaire on quality of life, WHOQOL-BREF, and the questionnaire to evaluate the functional capacity, Human Activity Profile (HAP). Data were stored in the software Statistical Package for Social Sciences 20.0 (SPSS, IBM Company, Chicago, IL). There was a reduced global quality of life in the patients with schistosomiasis mansoni when compared to controls ($p<0.007$). **Conclusion:** Patients with hepatosplenic schistosomiasis and SMR had lower scores of quality of life compared to control group. The analysis by domains of the WHOQOL-BREF showed no significant associations, as well as in the evaluation of functional performance. In conclusion, lower quality of life is more evident in schistosomiasis mansoni than the quality of life of uninfected. The disease did not alter functional performance. Other associated diseases (hypertension, diabetes mellitus, thyroid disease and others) also did not change the quality of life of people with schistosomiasis.

Financial support: FAPEMIG, CNPq, CAPES.

OP2-14

VESTIBULAR EVOKED MYOGENIC POTENTIAL WITH GALVANIC STIMULATION: A POSSIBLE TOOL TO ASSESS SPINAL CORD FUNCTION IN SCHISTOSOMAL MYELORADICULOPATHY

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Introduction: The follow-up of schistosomal myeloradiculopathy (SMR) relies mainly on neurological examination to guide therapeutic decisions. Magnetic resonance imaging (MRI) clarifies the diagnosis in most cases, but the MRI may normalize after treatment initiation even when clinical recovery is incomplete. Vestibular evoked myogenic potential (VEMP) with galvanic vestibular stimulation (GVS) is a simple, safe, low-cost and noninvasive technique that has been used to test spinal cord function in motor myelopathies. This paper reports the results of VEMP trigged by GVS in SMR patients. **Methods and Results:** A cross-sectional comparative study enrolled 22 patients with definite SMR and 22 healthy controls that were submitted to clinical, neurological examination and GVS. Galvanic stimulus was applied in the mastoid bones in a transcranial configuration for testing VEMP, which was recorded by electromyography (EMG) in the soleus muscles. Among patients with SMR, 11 underwent an MRI. The VEMP variables of interest were blindly measured by two independent examiners. They were the short-latency (SL) and the medium-latency (ML) components of the biphasic EMG wave. VEMP showed the components SL ($p=0.001$) and ML ($p<0.001$) delayed in SMR compared to controls; the delay of SL ($p=0.010$) and of ML ($p=0.020$) was associated with gait dysfunction. The MRI was normal in 10 patients (91%), but VEMP was altered in these same participants. A coincidence of altered MRI and VEMP was found in one patient. **Conclusion:** VEMP triggered by GVS identified alterations

in SMR not diagnosed by imaging and provided additional functional information that legitimates the use of this test in motor myelopathies.

Financial support: FAPEMIG, CAPES, CNPq.

OP2-15

SCANNING ELECTRON MICROSCOPY OF ULTRASTRUCTURE OF WORMS OF SCHISTOSOMA MANSONI AFTER IN VITRO EXPOSURE TO LPQM-39 COMPOUND

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Introduction: Schistosomiasis is a chronic and debilitating disease caused by helminthes of genus *Schistosoma*. More than 207 million people are infected worldwide, with an estimated 700 million people at risk in 74 endemic countries. The only drug available for treating schistosomiasis is praziquantel, however there are already reports of resistance to its use in treatment, making necessary to search and develop new antischistosomal compounds (1,2). In this context, The thiazoles derivatives are promising molecules, demonstrating a broad pharmacological profile, including acting as antiprotozoal drugs (3).

Methodology: *S. mansoni* worms were recovered from Swiss mice infected with 120 cercariaes and incubated with the compound LpQM/SC-39 (concentration variation of 5-100 μg/mL) in culture dish containing complete RPMI medium at 37 °C in a humidified atmosphere containing 5% CO_2 gas for a period of 192h. Each concentration was tested in three wells, the first well received four females, the second well received four males and the third well received two pairs of worms. For ultrastructural study, samples of *Schistosoma* incubated with 100 μg/mL of compound for 10h and 22h were analyzed by means of Scanning electron microscopy using method described in ref. 4.

Results: The worms treated with LpQM/SC-39 showed 100% mortality in the dose of 100 μg/mL with 72h of exposure. Another alteration was the change in the worm coloring and the lack of oviposition. In ultrastructural study was observed severe damage of the tegument with peeling, exposure of sub integumental tissue and disintegration of the tegument in same area with 10h hours of exposure. The severity of tegument damage was higher 22 h of exposure, with an increasing number of tubercles completely destructed and disintegration of the tegument in this area.

Conclusion: The present results suggest that the compound LpQM/SC-39 have antischistosomal activities with possible action on the integument of the worm and provide a sound basis for further in-depth studies of the antischistosomal properties of LpQM-45.

Acknowledgements: FIOCRUZ and CNPq for financial support and scholarships.

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Acknowledgements: FIOCRUZ and CNPq for financial support and scholarships.

AN ATTEMPT TO TACKLE SCHISTOSOMIASIS BY TARGETING HISTONE MODIFYING ENZYMES

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Schistosomiasis is the second most prevalent parasitic disease in the world. Currently, the treatment of this disease rely on a single drug, Praziquantel; and due to the identification of resistant parasites, the development of new drugs are urged. Histone modifying enzymes (HMEs) play a central role in regulating chromatin epigenetic modifications and are implicated as therapeutic targets in various diseases, which motivated this study. Crystallographic studies demonstrated that the HME Histone Deacetylase 8 (HDAC8) of the *Schistosoma mansoni* presents a different catalytic site compared to the human enzyme, which may confer specificity and enhance its potential as target. In this work, we used specific inhibitors to interrogate HMEs as drug targets against the parasite. Schistosomula parasites were exposed to four compounds (MS30, MS142, PE24/8 and J1036) and tested, either, *in vitro* or *in vivo*. After 72 hours, parasites cultivated *in vitro* were exposed to the inhibitor MS30 and showed an increased mortality of 24,8% when compared to controls. Moreover, during *in vivo* assays, schistosomules exposed to PE24/8 and J1036 were inoculated in mice and perfused after 35 days of infection. Mice inoculated with parasites exposed to J1036 exhibited a reduction of 67% in oviposition and 37% in worm burden. These results indicates a possible role of Histone Deacetylase in the parasite viability, oviposition and/or reproductive system, confirming the potential of these enzymes as drug targets. In addition, fluorescence based assays using Alamar Blue and/or L-Lactate Assay kit are being tested with new compounds produced by the Anti-Parasitic Drug Discovery in Epigenetics consortium. At this time, schistosomules are subjected to treatment with inhibitors for 48 hours and the amount of lactate are measured. These inhibitors are also being tested on adult worms, in which parasites mobility are evaluated after 48 hours of compounds exposure using the WormAssay software. Furthermore, previous study showed that HDAC8 of *S. mansoni* might be restricted to the cell cytoplasm, thus SmHDAC8 would have a different function from the human HDAC8. Hence, we aim to verify whether this enzyme has a role in histone modification and consequent regulation of gene expression.

Financial Support: CNPq, FAPEMIG, European Commission FP7 (HEALTH-F3-2013-602080). Anti-parasitic drug discovery in epigenetics. (A-ParaDDisE), CPqRR.

PRODUCTION OF POLYCLONAL ANTIBODIES SPECIFIC TO *SCHISTOSOMA MANSONI* CRUDE ANTIGENS FOR USE IN DIAGNOSTIC TESTS

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Introduction: Schistosomiasis is a serious problem of public health in the world. Improvement and development of new diagnostic tests are necessary to the disease control. Currently available methods have demonstrated low sensitivity to detect patients with low parasite load. Thus, the addition of the immunological techniques has increased the accuracy of diagnosis in endemic areas. Polyclonal antibodies (pAbs) have high specificity for the recognition of different epitopes. Their efficiency in diagnostic kits has gained attention for allowing the use of low concentrations to large-scale. Laboratories in Brazil still lack production independence and routinely import these expensive products from developed countries. The objective of this work is to produce pAbs anti crude antigens from *Schistosoma mansoni* using *in vitro* methodology and to conjugate these to horseradish peroxidase (HRP), aiming its application on immunodiagnostic tests. **Methods and results:** BALB/c mice (4-6 weeks) were immunized with 50 µg of adult worm (SWAP) and egg (SEA) soluble crude antigens from *S. mansoni*. Sera samples from BALB/c immunized mice were collected and screened by ELISA. Sensitized mice were sacrificed and B lymphocytes were obtained from spleen. These cells were fused to sp2/0-Ag14 myeloma cells. Hybridomas were selected by ELISA and then cultured in order to induce pAbs production. pAbs were purified by ammonium sulfate and their specificity confirmed by western blotting. Further steps will allow the conjugation of pAbs to HRP and, finally, its application on schistosomiasis mansoni diagnostic assays using endemic area positive sera. Partial results showed that mice were properly immunized. Hybridomas were selected, anti-SWAP (OD=0.761) and anti-SEA (OD=2.741). Antibodies were quantified by Lowry: anti-SWAP (2,61 µg/µl) and anti-sea (2,20 µg/µl). Western blotting analysis showed specific pAbs for antigens. **Conclusions:** pAbs will be used in the development of new diagnostic methods, helping in the schistosomiasis control.

Financial support: CPqRR; FIOCRUZ; FIOTEC; PDTIS.

OP2-18

ACTIVITY OF IBUPROFEN AGAINST *Schistosoma mansoni*

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Introduction: Schistosomiasis, neglected tropical disease, is a serious health problem worldwide. Currently chemotherapy is the most important measure used for the control of schistosomiasis in endemic areas. Since praziquantel is the only drug used for the treatment of the disease grows, among researchers, concern about the emergence of resistance and the need to develop news antischistosomal drugs. Ibuprofen, a nonsteroidal anti-inflammatory drug has been evaluated on *Schistosoma mansoni* worms *in vitro* and *in vivo*.
Methodology: Mice infected with 100 ± 10 *S. mansoni* cercariae (LE strain) were treated, with ibuprofen and praziquantel, monotherapy or in association. Fifteen days after treatment, worms from mesentery and liver of the treated animals could be collected by means of perfusion, as well as from mice of the control group (infected and untreated animals). The liver of the animals was crushed between two glass plates, observed under a stereomicroscope for dead worms countings. Fragments were collected from the distal part of the small intestine of the animals, squeezed between glass and plastic cover slip, and examined under a microscope in order to observe the oogram. The activity indicators were: mean worm burden, worm distribution in the portal and mesenteric veins, worm mortality rate and oogram changes.
Results: In mice infected with *S. mansoni* no activity was found with 1.0, 2.0 or 5.0mg/kg, single oral dose of ibuprofen. When ibuprofen 2.0 or 5.0mg/kg, single oral dose was administered associated with praziquantel 200mg/kg single oral dose (sub curative dose), an increase of activity of this last drug was observed, showing synergistic action of ibuprofen and praziquantel. When ibuprofen alone was administered at 2.0mg/kg and the infection was made 24 hours after treatment a decrease of 30.4% of worm burden was observed after 45 days of infection.
Conclusions: Ibuprofen on its own does not present activity against *S. mansoni* adult worms but it shows a partial preventive effect and, when used in association with praziquantel, presents synergistic effect. These results encourage further study of ibuprofen both in preventive and in curative activity.

OP2-19

EVALUATION OF SCHISTOSOMICIDAL ACTIVITY OF CARVACROL AND CARVACROL ACETATE: IN VITRO AND IN VIVO EXPERIMENTS

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Introduction: The schistosomicidal activity of carvacrol and carvacrol acetate was studied in *in vitro* and *in vivo experiments.* Carvacrol is a phenyl monoterpenóide chemically named 2-methyl-5- (1-methylethyl) –phenol, molecular formula C10H14O and weight 150.22g/mol. It is presented in liquid form of light yellow color, density 0.975g/ml, characteristic and pungent aromatic smell, similar to oregano, as well as poor solubility in water.
Methodology: *In vitro* trials: *Schistosoma mansoni* adult worms were distributed into six-well-plates (4 pairs of worms/well) and were kept in culture medium RPMI-1640 supplemented with 5% foetal bovine serum, 100 µg/mL penicillin/streptomycin antibiotics, exposed to the compound (4 or 8µl/ml) for 24 h and maintained in an incubator at 37ºC and 5% CO2. Afterwards, the worms were washed with culture medium and maintained under the same previous conditions, but without compounds until the end of the trial. Observations were performed using an inverted microscope and photos were taken daily for 1-24 h until seven days after the start of the culture. The culture medium was changed on alternate days. *In vivo* trials: Mice infected with *S. mansoni* cercariae (LE strain) were treated 45 days post-infection with 15 or 30mg/animal or 300mg/kg during 5 consecutive days (orally), sacrificed and submitted to portal-hepatic perfusion 15 days after treatment followed by worm collection from mesenteric veins and liver. t was also counted the dead worms in the liver and the observation of oogram changes. In both experiment was made a control group, with the exception of the compound, it was on the same conditions to the experimental group.
Results: The two compouns showed activity with the concentration of 4µg/ml, killing the adult worms in less than 24 hours of contact when the experiments were realized *in vitro*. In the *in vivo* experiments it was not observed significant schistosomicidal activity in theraputic regimen used.
Conclusions: *In vivo* experiments should always be performed to confirm the results presented by *in vitro* tests. Only in vitro experiments are not enough to characterize an antischistosomal agent.

OP2-20

EVALUATION OF KK, POC-CCA AND PCR-ELISA FOR DIAGNOSING *SCHISTOSOMA MANSONI* INFECTION AMONG SCHOOL-AGED CHILDREN BEFORE AND UP TO ONE MONTH AFTER TREATMENT WITH PRAZIQUANTEL

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Introduction. In 2012, the Brazilian Ministry of Health (MoH) created an Action Plan to eliminate schistosomiasis as a public health problem by 2020. This goal may be compromised if the parasitological diagnosis is not sufficiently sensitive and specific to detect low levels of infection. The Kato-Katz (KK) method, currently recommended by the MoH, has low sensitivity, which makes it necessary to increase the number of faecal samples or use it in combination with other methods. POC-CCA is a commercially available method that is faster and easier than the KK; however, it has not been validated for use in settings of the MoH's Action Plan.

Methods. A cohort of 113 school-aged children from Malacacheta (MG) was studied. A baseline parasitological survey was followed by treatment with PZQ (60 mg/kg), and two subsequent surveys (two and four weeks after treatment) The diagnosis tests were KK (four slides from a single stool sample), POC-CCA (single urine sample) and PCR-ELISA (single 500mg stool sample). The sensitivity and specificity of both POC-CCA and PCR-ELISA were evaluated taking KK as reference.

Results. At baseline, there was no significant difference in sensitivity among POC-CCA, single KK and PCR-ELISA using quadruplicate KK as reference; however, specificity of POC-CCA was significantly less than that of single KK. At follow-up, the small number of egg-positive subjects compromised the assessment of sensitivity; specificity of both POC-CCA and PCR-ELISA was significantly less than that of single KK. No significant difference in agreement was detected between POC-CCA and PCR-ELISA for diagnosing KK egg-negatives and KK egg-positives at baseline, regardless of the intensity of infection. Neither POC-CCA nor PCR-ELISA showed significant reduction in infection up to one month after treatment. Distinction between "negative" and "trace" readings of POC-CCA was subjective and needs standardization

Conclusion. Further work on POC-CCA is required prior to its incorporation into the schistosomiasis surveillance actions, including follow-up for longer periods post-treatment.

This work received support from Ghent University, PCTC/NTD-WHO and PAPES-Fiocruz

GENOTOXIC ACTION OF PRAZIQUANTEL IN MAMMALIAN CELLS

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Introduction: Schistosomiasis remains a major public health problem in the country, and an important cause of morbidity and mortality of the population. The maintenance and expansion of the disease arise from migration, the fecal contamination of water resources, the widespread distribution of intermediate hosts, the longevity of the disease and the lack of health education. Its pathogenesis is dependent on the interaction between helminth *Schistosoma mansoni* and the host, affecting different organs and systems. Praziquantel (PZQ) is the medicine used in endemic areas of the country; however, the literature is scarce in relation to mutagenic activity. This study employed the micronucleus and metaphase test in bone marrow cells from healthy *Swiss webster* mice, subjected to treatment with PZQ. This test is of particular relevance to humans because it detects cytotoxic and genotoxic effects, as there are reports about genetic and neoplastic diseases caused by such factors. **Methods:** Two groups were used (30/micronucleus test and 20/metaphase test), and administered doses of 40, 60 and 80 mg/kg in both tests by gavage and cyclophosphamide (CPA) - 25 mg/kg, and water (10 ml/kg), as positive and negative controls, respectively. After 24 hours, the bone marrow was extracted and cytogenetics testing and analysis in optical microscopy (10x100x) were made. **Results:** The frequency of cells with micronuclei was 1.59%, 1.49% and 1.91% for doses of 40, 60 and 80, respectively. The frequency of CAs to PZQ were 30.5%, 35.0% and 39.0% corresponding to doses of 40, 60 and 80 mg/kg; for the CPA, micronucleus formation were observed in 1.85% and 39.5% for CAs. The result was 0.3% of the negative control for both assays. All doses differ from the negative control in the analysis of cytotoxicity in both tests (mitotic index for the metaphase test and EPC/ENC ratio in the micronucleus test). The cytotoxicity tests proved interference on cell proliferation induced by PZQ. Both controls have ensured the reliability of the tests. **Conclusion:** Based on the results shown, the drug PZQ may be considered genotoxic and cytotoxic in both tests, thus making its use be reconsidered in treatments applied to people today.

OP2-22

EXPERIMENTAL MODEL TO INDUCE SCHISTOSOMAL MYELORADICULOPATHY IN LABORATORY ANIMALS.

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Introduction: Schistosomal myeloradiculopathy (SMR) is a severe form of presentation of schistosomiasis, in which eggs and/or adults of *Schistosoma* affects the spinal cord. We developed an animal model of SRM caused by *S. mansoni*, and characterized the sensory and motor changes caused by the deposition of eggs of *S. mansoni* in the spinal cord. **Methods and Results:** The experiment consisted of two groups of animals (infected and control), which were divided into six subgroups of five male Wistar rats each in 10, 20 and 30 days post-infection. The experimental groups were anaesthetized with halothane and injected with a suspension of *S. mansoni* eggs in the subarachnoid space. Control animals were injected with phosphate buffer solution (PBS) administration. We used the Hot Plate to measure the thermal sensitivity, the digital analgesymeter to evaluate the mechanical sensitivity and the Grip Strength Meter to assess the strength. Infected rats presented reduced surface mechanical sensitivity, thermal sensitivity and increased grip strength, associated to the presence of *S. mansoni* eggs in the spinal cord. **Conclusion:** The model developed herein may be suitable for evaluating of functional changes related to the presence of *S. mansoni* eggs in the spinal cord of experimentally infected rats.

Key-words: Neuroschistosomiasis; Schistosoma mansoni; Animal Models, Nociception Test.

Financial Support: Proef e Promob / Fapitec / Capes.

Fractions from antigens of *Schistosoma mansoni* eggs are promising to develop new immunodiagnostic method to acute, chronic and post treatment phase of infection

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Introduction: Schistosomiasis mansoni is a serious problem of public health in the world. The gold standard method Kato-Katz has demonstrated low sensitivity to detect patients with low parasite load. Thus, the improvement and development of new diagnostic tests is necessary to the disease control. In endemic areas in North of the Minas Gerais, Brazil, the association of immunological techniques to parasitological method has increased the accuracy of diagnosis. The first aim of this work is select antigenic fractions from either one soluble crude antigen from schistosomula tegument, adult worms and eggs, which could differentiate between acute and chronic phase as well as identify both phases and the cure after treatment. The second aim is produce the recombinant antigens and apply these antigens in point-of-care method (POC) to detect antibody. **Methodology:** Swiss female mice (4-6 weeks) were infected with 40 cercariae of *Schistosoma mansoni* to produce crude antigens. After 45 days, the mice were sacrificed to recover the adult worms and the eggs in the livers. The adult worms and eggs were macerated and the soluble antigens SWAP and SEA was obtained, respectively. To obtain the schistosomula antigens (SSTA) cercariae were mechanically transformed to schistosomula, cultured for 24 hours and the surface antigens were extracted by biotinylation. The mice serum were collected every 7 days after infection until 68 days. The human samples at acute phase (2-3 moths of infection), chronic and post treatment phase (endemic areas) were also collected. These samples were screened by western blotting using SEA antigen. In the next steps, the mice serum will be collected until 180 days after infection and screened against the others crude antigens by western blotting. The promising immunoreactive fractions will be identified by mass spectrometry and analyzed by bioinformatics tools. **Results**: The fractions selected from SEA (12-13, 20, 50 kDa) were detected in mice and human samples. The fractions with 12-13 and 50 kDa reacted with mice serum with 40 days post infection. The fraction with 20 kDa started to react with mice serum near to 60 days after infection. This fraction was not identified in patients in acute form, corroborating with mice data. In human samples, the 12-13 kDa is stronger in the acute form and 20 kDa in the chronic form. However, the 20 kDa intensity was decreased after treatment. The experiments using serum of mice in the late phase of infection is still necessary. **Conclusions:** The fractions selected will be identified by mass spectrometry and recombinant proteins will be produced. These proteins will be used to develop a new immunodiagnostic method based on POC. This assay is fast, simple, requires few equipment and it is an accurate tool of screening in low resource-regions. Identifying these markers will aid in the improvement of schistosomiasis diagnostic.

OP2-24

EVALUATION OF A NEW TEST FOR DETECTION OF SCHISTOSOMIASIS (POC-CCA) IN MICE EXPERIMENTALLY INFECTED

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Introduction: The technique of Kato-Katz is the most common method to detect infection by *Schistosoma mansoni*. However, the low sensitivity in endemic areas where patients have low loads of worms and after treatment are limiting factors for the use of this technique. The development of a new method is necessary to fulfill these gaps and must be of easy realization and non-invasive and with a rapid response. This study evaluated the new test point of care cathodic antigen (POC-CCA) using urine as a tool for the diagnosis of *Schistosoma mansoni*.

Methodology: Group of mice infected with 10 or 100 cercariae of *S.mansoni* were treated after 45 days of infection with praziquantel dose of 400mg/kg X 2 administered orally with an interval of 3 days between the two doses. The mice urine was collected on different days after treatment for the detection of schistosomiasis (Rapidmedical diagnosis^{R}). Parallel urines were collected from control mice (infected with the same load cercaria and untreated) as well as uninfected mice for control of positive and negative diagnosis. The results interpretation are Positive, Negative, Trace.

Results: The majority of uninfected mice present negative urine test, others present trace results. Infected and untreated mice present positive test in others trace results. Seven days after treatment of infected mice some present negative and also trace. **Conclusion:** The result shows that is possible to differentiate between positive and negative schistosomiasis cases. Nevertheless trace is a trouble for definitive diagnosis. Further evaluation is needed to determine the sensitivity and accuracy of the test.

OP3-01

GENETIC LINKAGE ANALYSIS OF PRAZIQUANTEL RESISTANCE

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Introduction: We previously selected a resistant parasite (LE-PZQ) using successive praziquantel (PZQ) treatment of *Schistosoma mansoni*-infected *Biomphalaria glabrata* snails. LE-PZQ is 5x more resistant than the unselected parasite population (LE). In this study, we used genetic crosses between LE-PZQ and a PZQ-sensitive parasite (EG) to determine the location of genes underlying PZQ-resistance. Methods and Results: We used a linkage mapping method (Extreme QTL) designed for rapid QTL identification from pools of selected F2 progeny. We crossed parasites from LE-PZQ (resistant males) and EG (sensitive females), then two F1 individuals to generate multiple F2 progeny. We exposed large replicate pools of F2 adult male parasites to PZQ *in vitro* and collected parasites that died or survived following treatment. Drug response in parents and F2 males was determined using an automated assay to quantify movement inhibition after exposure to PZQ. We sequenced exome capture libraries from parents and pooled F2 progeny (resistant, sensitive and untreated males) using an Illumina HiSeq2500. Sequencing data were processed using a custom pipeline and we compared SNP allele frequencies between resistant and sensitive or control libraries to identify genome regions showing significant differences in replicate experiments. F2 males showed ~90% mortality after exposure to PZQ. Deep sequencing of F2 progeny pools gave accurate allele frequencies for 14,846 SNPs. Four scaffolds showing strong linkage to PZQ-resistance were identified. These scaffolds cover 4.29 Mb and contain 110 genes. Seventeen genes are not expressed in adult worms and 49 have identical alleles in both parents. Of 53 remaining genes, 212 SNPs in 47 genes show highly significant enrichment of alleles from the resistant parent. These genes fall into several functional classes and include several exciting candidate genes. Moreover, our data suggest that PZQ-resistance is recessive, because: (1) F1s were PZQ-sensitive; (2) F2s that survived treatment are homozygous for alleles from the resistant parent in the genome region of interest. Conclusions: We have identified a genome region containing several candidate PZQ-resistance genes, which we will attempt to functionally validate. Identification of the gene(s) underlying PZQ-resistance will allow development of molecular methods for monitoring resistance, improve our understanding of the mechanism of action of PZQ and guide development of new drugs.

CAPES, UTHSCSA, TBRI, NIH, WHO

OP3-02

"INFLUENCE OF INFECTION BY *Schistosoma mansoni*, IgG1 AND IgG4 anti-SEA AND ITS ASSOCIATION TO THE SYMPTOMS OF ALLERGIC ASTHMA"

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INTRODUCTION: Asthma is a disease associated with genetic predisposition and environmental factors that affect the human airways, being common in children and adolescents. Studies indicate that helminth infections can trigger an immunomodulation and decrease of inflammatory responses. AIM: evaluate the influence of infection by *Schistosoma mansoni* and geohelminths, and IgG1 and IgG4 anti-Soluble Egg Antigen (SEA) on the symptoms of allergic asthma in children in Itamaracá, Pernambuco. METODOLOGY: Stool samples were collected and analyzed by the methods of Kato-Katz and Hoffman, Pons and Janer in 574 children registered between 2 and 14 years old. Variables related to allergic asthma (number of asthma crises in the last year, difficulty in speaking during crises and dry cough at night) were collected using the standardized questionnaire *International Study of Asthma and Allergies in Childhood*. Blood sample was collected to measure levels of IgG1 and IgG4 anti-SEA antibodies by indirect ELISA. The parasitological examination was performed in 368 subjects, 76 (20.6%) were classified as asthmatic and 292 (79.3%) as non-asthmatic. Twenty-eight children (7.6%) were infected with helminths, being 21.4% asthmatics and 78.6% non-asthmatics. The measurement of IgG1 and IgG4 antibodies was performed in the serum of 62 individuals, 43 uninfected, 15 with geohelminths and 4 infected with *S. mansoni*. RESULTS: The levels of IgG4 anti-SEA in patients infected with *S.mansoni* and geohelminths showed significant difference from the control group. The group of *S .mansoni* also showed differences with geohelminths group. In relation to anti-SEA IgG1 levels, the group of patients infected with geohelminths showed no difference compared to the control group, but there was significant difference in *S. mansoni* group compared with control. With respect to variables related to allergic asthma, 78.5% of asthmatic uninfected and 66.7% of asthmatic infected

children had crises in the last year. The proportion of children with difficulty in speaking during the crisis was two times higher in asthmatic uninfected children.There were no differences regarding dry cough at night.CONCLUSION:20.6% of patients in the study were classified as asthmatic.There was a low frequency of individuals infected by helminths, being 21.4% asthmatics and 78.6% non-asthmatics. The antibody levels were higher in groups of infected individuals, which showed low frequency of symptoms related to allergic diseases.

Keywords: Asthma allergic; *Schistosoma mansoni*; Geohelminths; IgG anti-SEA.

CHAMADA UNIVERSAL - MCTI/CNPQ Nº 14/2012 processo 478.508.201-23 MCTI/CNPq/MS-SCTIE-Decit Nº 40/2012 - Pesquisa em Doenças Negligenciadas processo 478.508.201-23

OP3-03

ASSESSING THE IMMUNE MECHANISMS OF THE RADIATION-ATTENUATED SCHISTOSOME VACCINE BY MICROARRAY ANALYSIS

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Introduction: In spite of several decades of research an effective vaccine against schistosomiasis remains elusive. The best vaccination model with high protection levels is the radiation-attenuated cercariae. However, the immune mechanisms responsible for the high protective effect elicited by attenuated schistosome larvae have not yet been fully characterized. In an attempt to better understand this model, we have used a Systems Vaccinology approach through the analyses of gene expression of mice PBMC after immunization, challenge or infection. **Objectives:** In this sense, this work aims to apply a more holistic strategy to characterize the protective immune responses after immunization with one dose (1V group), three doses (3V group) and infection with normal parasites (Infected group), and identify the biological pathways that are altered in these conditions by microarray analysis. **Methods:** After immunization/challenge or infection a series of parameters were analyzed, such as hemogram, immunophenotypic profile of blood leukocytes and parasite burden. We also evaluated gene expression of peripheral blood mononuclear cells (PBMC) in search for signatures of innate and adaptive immunity associated with the protective immune responses. **Results and Discussion:** Here, we have confirmed the high level of protection of the attenuated cercariae model, especially after 3 doses. Concerning the hematological parameters, the main change observed was a decrease in the platelets number in the infected group and an increase in the 1V and 3V groups, which correlates with the protection level.

Following microarray raw data treatment and different statistical tests, gene set enrichment analysis (GSEA) was performed. The most striking time point revealed by GSEA analysis was 7dpi, showing in the infected group a negative regulation of coagulation pathways (mostly involving platelets) and FGFR. On the other hand, groups immunized with 1 or 3 doses, revealed activation of gene sets related to growth factor signaling (FGFR/VEGF/EGF) and immune responses (Th1, Th1/Th2, IL-12, IL15, IL23). In addition the 3V group showed a more broad range of response (IL-6, NK, Mast Cells). Our next steps will be the validation of gene sets by functional assays. Thus, we believe that new mechanisms of action and prediction of immunogenicity and protection could be revealed on the molecular basis, allowing the future design of novel delivery systems and adjuvants for recombinant subunit vaccines.

Supported by FAPESP (12/18095-5 and 12/23124-4) and Fundação Butantan.

OP3-04

Differential responses of human epithelial cells from bladder and biliary tract to eggs of *Schistosoma haematobium* and *S. mansoni*

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More than 200 million people are afflicted with schistosomiasis; infection with *Schistosoma japonicum* and *S. mansoni* causes hepatointestinal schistosomiasis and *S. haematobium* causes urogenital schistosomiasis (UGS). UGS is associated with hematuria, major bladder wall pathology and hydronephrosis leading to kidney damage, whereas chronic deposition of eggs of *S. haematobium* frequently leads to squamous cell carcinoma of the bladder. Notably among these diverse forms of schistosomiasis, UGS is the classified as a group 1 carcinogen by the International Agency for Research on Cancer. However, the cellular and/or molecular mechanisms linking UGS with carcinogenesis have yet to be defined. Herein, we investigated the effects of co-culture with eggs of *S. haematobium* on epithelial cell lines, HCV29 established from human bladder urothelium and H69 from the human cholangiocytes. Cell growth of HCV29 and H69 cultured with *S. haematobium* and *S. mansoni* eggs was monitored using the xCELLigence real time cell assay (Acea Biosciences); xCELLigence monitors conductivity across electrodes lining the tissue culture well. Gene expression analysis of the cells was also undertaken, specifically on gene networks and pathways involved in oncogenesis and in epithelial to mesenchymal transition. Schistosome eggs promoted proliferation of HCV29 urothelial cells: ~27% and ~14% more proliferation in cells exposed to *S. haematobium* or *S. mansoni* eggs, respectively than control cells. Proliferation to *S. haematobium* eggs was more pronounced than to eggs of *S. mansoni*, which is noteworthy given that eggs of *S. haematobium* transverse the urothelium to exit in the urine (whereas *S. mansoni* eggs transverse the gut to complete disease transmission). By contrast, both eggs of both schistosomes induced cell death of the cholangiocytes. Tumor suppressors, e.g. P53, and metalloprotease inhibitors were down regulated in cells exposed to *S. mansoni* and *S. haematobium* eggs. *S. mansoni* eggs up regulated cell cycle regulators, e.g. E2F1 transcription factor, and the cell invasion-related proto-oncogene SH3PXD2A. *S. haematobium* eggs down regulated desmosomal proteins involve in cell-cell junctions and the platelet-derived growth factor receptor that plays a role in the migration of vascular smooth muscle cells and formation of the neointima at vascular injury sites. Proliferative changes appeared to depend not only on the species of schistosome, but also on the organ system origin of the epithelial cells. Deeper study of cellular and/ or molecular mechanisms linking the UGS and the development of bladder cancer can be expected to aid discovery of new interventions for this neglected tropical disease-related cancer.

OP3-05

VACCINATION WITH RECOMBINANT PROTEIN 77 FROM *SCHISTOSOMA MANSONI* PROTECTED MICE AGAINST PARASITE CHALLENGING

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Introduction: The flatworm *Schistosoma mansoni* is a blood parasite that causes schistosomiasis, a debilitating disease that occurs throughout the developing world. Current schistosomiasis control strategies are mainly based on chemotherapy, but many researchers believe that the best long-term strategy to control schistosomiasis is through immunization with an anti-schistosomiasis vaccine by itself or combined with drug treatment. The Protein 77 is a 16.5-kDa protein possibly secreted by schistosomula and adult worms (male and female). Its function is not known but in silico analysis pointed to the presence of Kunitz domains suggesting that Protein 77 might be related to inhibition of serine proteases. We believe this protein is possibly involved in various physiological processes, such as blocking blood clot formation and inflammation around the worms, suggesting a critical role in parasite survival inside the host. **Methods and Results:** Here, we describe the processes of cloning and heterologous expression of the recombinant Protein 77 from *S. mansoni* in *Escherichia coli* and its utilization in the formulation of a recombinant vaccine. Quantitative real time PCR (qPCR) analysis revealed that Protein 77 gene is highly expressed in schistosomula stage. Mice immunization with recombinant Protein 77, formulated with Freund's adjuvant, induces a Th1-type response, as suggested by the production of specific IgG antibodies, and also IFN-γ and TNF-α by cultured splenocytes. The protection engendered by this vaccination protocol is 51.5% reduction in worm burden, 36.0% reduction in eggs in liver, 31.0% and 33.0% reduction in granuloma number and area, respectively. **Conclusion:** Taken together, the data herein presented supports Protein 77 as a the potential candidate for the development of a vaccine to control schistosomiasis

Financial Support: CNPq, FAPEMIG, Capes.

SCHISTOSOMA MANSONI ANTIGENS REDUCES T CELLS ACTIVATION IN SEVERE ASTHMA.

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Background: Studies have reported the ability of *Schistosoma mansoni* infection in reduce the severity of asthma and prevent atopy. The aim of this study was to evaluate the ability of *S. mansoni* antigens, Sm29 and Sm29-TSP2 in modulating lymphocyte activation of asthmatics *in vitro* in response to the allergen of the mite *Dermatophagoides pteronyssinus* (*Der p*1). **Materials and methods:** Seventeen patients with severe asthma have been enrolled in this study. Peripheral blood mononuclear cells (PBMC) were obtained and stimulated with Sm29 and Sm29-TSP2 in the presence or absence of *Der p1*. The expression of surface markers and cytokines on lymphocytes were evaluated by flow cytometry. **Results:** It was observed that cultures stimulated with *Der p1* [0,64% (0,36% - 1,45%)], *Der p1*+Sm29 [0,97% (0,44% - 2,05%)], *Der p1*+Sm29-TSP2 [0,79% (0,44% - 1,94%)], Sm29 [0,70% (0,26% - 1,66%)] and Sm29-TSP2 [0,63% (0,26% - 1,06%)] lead to an increase in the frequency of T $CD4^{+}CD25^{high}$ cells compared with unstimulated cultures [0,32% (0,07% - 0,68%; $p<0.05$)]. Additionally there was a decrease in the frequency of T $CD4^{+}CD25^{low}$ cells in the cultures stimulated with *Der p*1+Sm29 [2,77% (0,90% - 10,60%)], *Der p*1+Sms9-TSP2 [2,63% (1,07% - 9,92%)], Sm29 [1,78% (0,44% - 3,78%)] and Sm29-TSP2 [1,36% (0,97% - 2,46%)] compared with cultures stimulated with *Der p*1 [3,93% (1,30% - 11,60%)]. The adittion of Sm29 in the cultures stimulated with *Der p1* reduced the frequency of T $CD4^{+}CD69^{+}$ lymphocytes [0,72% (0,38% - 1,6%)] compared with cultures stimulated with *Der p*1 [1,27% (0,38% - 3,41%)] and this reduction also was observed in the cultures stimulated only with Sm29 [0,52% (0,17% - 2,15%)] and Sm29-TSP2 [0,36% (0,15% - 1,69%)] or SE [0,29% (0,07% - 2,24%); $p<0,001$]. In addition, there was a reduction in the frequency of T $CD4^{+}$ cells expressing IL-13 in the cultures stimulated with Sm29 [0,19% (0,01% - 1,2%)] compared with cultures stimulated with *Der p*1 [0,42% (0,06% - 3,35%)]. Similarly, we observed a lower frequency of T $CD4^{+}IL\text{-}5^{+}$ cells in cultures stimulated with Sm29 [0,11% (0,04% - 0,53%)] compared with *Der p*1 stimulated cultures [0,25% (0,12% - 1,70%)]. **Conclusion:** These results suggest that the addition of Sm29 and Sm29-TSP2 to the cells cultures of subjects with severe asthma was able to reduce cell activation and induce significant regulatory mechanisms to the control the inflammatory response in asthma.

Financial support: PRONEX, CNPq

OP3-07

OSTEOPONTIN IS INDUCED BY *SCHISTOSOMA MANSONI* EGG ANTIGENS AND CORRELATES WITH FIBROSIS AND PORTAL HYPERTENSION IN HUMAN AND EXPERIMENTAL SCHISTOSOMIASIS

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Introduction: Schistosomiasis is a major cause of fibrosis and portal hypertension worldwide. We evaluated the hypothesis that schistosome eggs release factors that directly stimulate liver cells to produce Osteopontin (OPN), a profibrogenic protein that stimulates hepatic stellate cells to become myofibroblasts. We also investigated the utility of OPN as a biomarker of fibrosis and/or severity of portal hypertension. **Methods and Results:** Cultured cholangiocytes, kupffer cells and hepatic stellate cells were treated with soluble egg antigen (SEA); OPN production was quantified by qRTPCR and ELISA; cell proliferation assessed by BrdU. Mice were infected with *S. mansoni* for 6 or 16 weeks to cause early or advanced fibrosis. Liver OPN was evaluated by qRTPCR and immunohistochemistry, and correlated with liver fibrosis and serum OPN. Livers from patients with schistosomiasis mansoni (early fibrosis n=15; advanced fibrosis n= 72) or healthy adults (n=22) were immunostained for OPN and fibrosis markers. Results were correlated with plasma OPN levels and

splenic vein pressures. To further investigate the role of OPN in schistosomiasis fibrosis and portal hypertension serum from CBA/J mice infected with S.mansoni for 20 weeks (moderate and hypersplenic syndrome – MSS and HSS corresponding to hepatointestinal and hepatosplenic human disease) were included. Serum from the same mice were collected 6, 8, 12, 16 and 20 weeks post infection. SEA induced cholangiocyte proliferation and OPN secretion ($p<0.001$ vs. controls). Cholangiocytes were OPN(+) in schistosoma-infected mice and humans. Liver and serum OPN levels correlated with fibrosis stage (mice: $r=0.861$; human $r=0.672$, $p=0.0001$) and myofibroblast accumulation (mice: $r=0.800$; human: $r=0.761$, $p=0.0001$). Numbers of OPN (+) bile ductules strongly correlated with splenic vein pressure ($r=0.778$; $p=0.001$). Mice with HSS had more serum OPN levels than MSS mice. Although during acute phase both syndromes have similar levels of OPN, MSS mice are able to downregulate its levels while HSS mice are unable to shutdown this profibrogenic molecule. **Conclusions:** *S. mansoni* egg antigens stimulate cholangiocyte proliferation and OPN secretion. OPN levels in liver and blood correlate with fibrosis stage and portal hypertension severity. OPN could be a good biomarker and a potential therapeutical target in schistosomiasis mansoni.

Financial support: CNPq, NIH, FAPEMIG, CAPES.

OP3-08

PROFILE OF NATURAL KILLER T CELLS (NKT) FROM ASTHMATIC INDIVIDUALS EXPOSED TO *Schistosoma mansoni* ANTIGENS

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Introduction: Asthma is a chronic inflammatory disease that course with production of Th2 cytokines. Cells from the innate immune response are important source of cytokines and must play a pivotal role in the initiation of the adaptive immune response. In this context, Natural Killer T cells (NKT) appear to have a critical role in the development or regulation of the immune response in asthma. These cells recognize glycolipids antigens, such as aGalCer, presented by non-polymorphic molecule CD1d. After activation, NKT cells rapidly secrete chemokines and citokines directing the adaptive immune response. When in contact with TGF-β, NKT expresses Foxp3 and produces IL-10, which is important to downregulate immune response. Several studies suggest that helminth infections likely regulate the immune response, promoting a beneficial effect in asthmatic individuals. Since *Schistosoma mansoni* eggs are rich in glycolipids, we hypothesized that antigens obtained from its eggs are able to induce a regulatory profile of NKT cells from asthmatic individuals. **Methods and Results:** This cross-sectional study investigated individuals with severe asthma and healthy individuals. Peripheral blood mononuclear cells (PBMC) was obtained and exposed to tetramer of CD1d conjugated with aGalCer or *S. mansoni* soluble egg antigen (SEA). PBMC of healthy individuals when cultivated in the presence of CD1d-SEA showed higher frequency of NKT cells [2.24 (0.42-33.0)] when compared to PBMC of severe asthmatics [0.20 (0.02-0.63); p=0.057]. However, the mean fluorescence intensity (MFI) of Va24Ja18 was higher in NKT cells of individuals with severe asthma than healthy ones, in all tested conditions. Frequency of CD28 in NKT cells from healthy individuals was downregulated by aGalCer or SEA (p=0.036), which was not observed in severe asthma. Moreover, the frequency of CD69 and intracellular expression of IL-10 was similar between healthy controls and asthmatic individuals, in all evaluated conditions. Finally, we observed no significant expression of CD25 or Foxp3 in NKT cells in this model. **Conclusion:** NKT cells from asthmatic individuals, besides in lower frequency in peripheral blood, is more reactive, since the expression of Va24Ja18 is higher than NKT cells of healthy controls. Moreover, our data suggest that aGalCer and SEA are able to inhibit expression of co-stimulatory molecules, highlighting its possible role in controlling activation of the immune response by NKT cells.

OP3-09

THE ROLE OF TEGUMENTAL ENOLASE IN PLASMINOGEN ACTIVATION BY *SCHISTOSOMA MANSONI*

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Introduction: Schistosomiasis affects more than 200 million people worldwide and causes up to 280,000 deaths yearly. Parasites, *Schistosoma mansoni*, are large blood flukes that live on human blood vessels and seem to be refractory to both immune elimination and thrombus formation. We hypothesize that parasites are able to activate fibrinolytic system in order to avoid clot formation on their surfaces. In this work, we characterize *S. mansoni* enzyme enolase (*Sm*Eno) and evaluate its potential function on plasminogen (PLMG) activation on schistosome surface.
Methods and Results: We demonstrate by RT-PCR that *SmEno* is highly expressed in schistosomula, as well as adult worms and eggs. Immunolocalization places the protein all over parasites' bodies and also indicates some accumulation on the tegument. We optimized enolase enzymatic assay and PLMG activation assay to demonstrate that tegumental *Sm*Eno is enzymatically functional and is able to bind to and enhance the activation human PLMG. The intravascular life stages can all promote significant PLMG activation in the presence of tissue plasminogen activator (tPA). This results in generation of the potent fibrinolytic agent plasmin, which could degrade blood clots forming around the worms *in vivo*. We produced a recombinant (r)*Sm*Eno by heterologous protein expression in *Escherichia coli* and r*Sm*Eno can bind PLMG and promote its activation. The enzyme catalyzes the interconversion of 2-phospho-D-glycerate and phosphoenolpyruvate, has maximal activity at pH 7.5, requires Mg^{2+} for optimal activity and is inhibited by NaF. Suppressing expression of the *SmEno* gene by treatment with specific siRNA significantly diminished enolase mRNA levels, protein levels and surface enzyme activity but, surprisingly, did not affect the ability of the worms to promote PLMG activation. ELISA and Western Bolt assays show that the worms possess several other PLMG-binding proteins and these may have a greater importance in schistosome-driven PLMG activation.
Conclusions: While SmEno can enhance PLMG activation our analysis suggests that it is not a major contributor to the parasite's ability to perform this function.

Financial support: CNPq, CAPES, NIH.

OP3-10

SCHISTOSOMIASIS HUMAN: EVALUATION OF RECEPTOR ANTAGONIST IL-13 (IL-13Rα2) AND CELLULAR IMMUNE RESPONSE IN DIFFERENT DEGREES PERIPORTAL FIBROSIS

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Introduction: Schistosomiasis is considered the second most prevalent human parasitic disease, and the only species found in Brazil is the *Schistosoma mansoni*. Currently, studies have been conducted to evaluate the immune response associated with the process of hepatic fibrogenesis. Th1 cytokines are being related with decreased fibrosis in schistosomiasis, while Th2 plays a role critical in the pathogenesis of the disease. IL-13 has been shown as the main pro-fibrotic cytokine and the control mechanisms activity are linked to its receptors. Studies in murine schistosomiasis model identified the participation of IL-13Rα2 in reduction of granuloma size and suppression of fibrosis. **Methods:** Seventy-four schistosomiasis patients were selected at the Hospital das Clinicas, Federal University of Pernambuco, Brazil. The control group (n=7), was formed by patients with pattern A (no fibrosis) and the case group was further subdivided into two categories: moderate fibrosis (C and D patterns; n=43) and advanced fibrosis (E and F patterns; n=24) according to Niamey classification. Whole blood were collected and cultured in RPMI 1640. Cultures were incubated without stimulation, with soluble egg antigen (SEA) or phorbol myristate acetate/ionomycin (PMA/Iono) stimulations. The culture supernatants were collected after 24h for dosage of IL-13, IL-13Rα2 and IFN-γ cytokines by ELISA and for IL-2, IL-4, IL-6, IL-10 and TNF-α cytokines by Cytometric Bead Array. To correlate the levels of the cytokines, the Spearman test was used. **Results:** In the groups with different degrees of fibrosis, were not detected increased levels of IL-13Rα2 and IL-13 (all $p>0.05$) cytokines after stimulation with SEA when compared with no stimulation, however we find increased levels in other cytokines assayed (all $p<0.05$). There was no significant difference between the three groups after stimulation with SEA, in the levels of IL-13Rα2 and Th1 and Th2 cytokines (all $p>0.05$). A negative correlation ($r= -0.801$; $p <0.0001$) between the IL-13Rα2 and the IL-13 was found and there was a positive correlation between Th1 and Th2 cytokines profile ($p>0.05$). **Conclusion:** The association of cytokines production and their receptors with varying degrees of periportal fibrosis is essential to contribute to increased knowledge about mechanisms involved in the process, reducing the potential risk to complications and generating knowledge about the development of a new immunotherapy for patients.

Footnote: Fundação Oswaldo Cruz (Fiocruz); Fundação de Amparo à Ciência e Tecnologia do Estado de Pernambuco (FACEPE).

OP3-11

EVALUATION AND UPDATING OF THE MEDICAL MALACOLOGY COLLECTION (FIOCRUZ-CMM) USING MOLECULAR TAXONOMY

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ABSTRACT

The biological collections are an important source of information providing knowledge and scientific development. The Medical Malacology Collection (Fiocruz-CMM) of René Rachou Research Center located at the Laboratory of Medical Helminthology and Malacology (LHMM) has currently about thirteen thousand specimens of molluscs of medical and veterinary importance, especially the genre *Biomphalaria.* Since 1990s, the LHMM receives molluscs from various regions of Brazil and abroad and utilizes morphological and/or molecular method for species' identification. Part of the collection has not been identified by molecular techniques and 332 collection points were unidentified. Thus, o objective of this present study was assess and rectify the identification of the mollusks of genre *Biomphalaria* of the Fiocruz-CMM. For this the collection was separated into two groups: group I: specimens inserted between 1993 and 2002 with 620 collection points and 5.137 specimens; group II: inserted between 2003 and 2009, with 464 collection points and 1.924 specimens. The specific identification of specimens from the collection was performed by morphology and/or PCR-RFLP. The results were grouped into six categories: 1) correct data, 2) errors (classified as other species), 3) adjustments (species in synonymy), 4) inconclusive (same species with different molecular profiles) 5) degraded material and 6) sample identified to first time (deposited without identification). In group I, 41.8% of collection points were with correct taxonomic data, 2.1% had errors; 0.8% was adjustment; 25.5% the identification was inconclusive, 1.9% were degraded that was impossible to identify and 27.9% were first time identified. In group II, 70,7% of collection points the specimens were with correct taxonomic data; 5,6% had errors; 10.1% was inconclusive, 5.4% of specimens were degraded making it impossible to identification and 8.2% of specimens were first time identified. The inconclusive category was *B. aff. straminea*, *B. tenagophila* from Argentina and *B. peregrina.* These data demonstrate the importance of using more than one technique in taxonomic confirmation and the good preservation of specimens' collection. These data was utilized to update the books receive mollusks and data of CRIA. The studies will continue in specimens of the inconclusive category.

Financial Support: Fapemig and CPqRR (Fiocruz-Minas)

CHARACTERIZATION OF THE miRNA AND piRNA PROCESSING PATHWAY IN *Biomphalaria glabrata*

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INTRODUCTION - The World Health Organization (WHO) estimates that about 240 million people in 78 countries require treatment for schistosomiasis, an endemic disease caused by trematodes of the genus *Schistosoma*. In Brazil, the *Schistosoma mansoni* is the only specie representative of this genus, whose passage through the invertebrate host, snails of the genus *Biomphalaria*, is mandatory before infecting a mammalian host, including humans. The availability of the genome and transcriptome of *B. glabrata* makes possible to study the regulation of gene expression, particularly those responsible by miRNA and piRNA processing pathway. This might assist in better knowledge the biology of *B. glabrata* as well as its relation to the parasite *S. mansoni*. Some aspects of this interaction are still poorly explored, including the participation of non-coding small RNAs, like miRNAs and piRNAs, potent regulators of gene expression with lengths varying from 19 to 30 nucleotides. METHODS AND RESULTS: Using bioinformatics tools and quantitative PCR, we seek to identify and characterize the processing pathway of miRNAs and piRNAs in *B. glabrata*. In the analyses using bioinformatics tools was possible identifying the high conservation of genes involved in miRNAs and piRNAs synthesis through conserved distribution domains, catalytic site residue and phylogenetic analysis. Our work also showed differential expression of the genes Argonaute, Drosha, Piwi, Exportin 5 and Tudor in different developmental stages and also during infection with S. mansoni, suggesting that the machinery required for processing the miRNA and piRNA are probably active in B. glabrata in all the stages, at the level of gene transcription. CONCLUSIONS: These data suggested that the silencing pathway mediated by miRNAs and piRNAs can interfere in the snail biology throughout its life cycle contributing all the time in the *B. glabrata/S. mansoni* interaction. More detailed studies need to be performed to confirm the participation of the predicted proteins of miRNAs and piRNAs pathway in the parasite/host relationship, mainly their effective participation in their target genes, since the *S. mansoni* does not express the piRNAs in its genome.

Financial support: CPqRR, FUNED, CNPq, CAPES e FAPEMIG

OP3-13

INFLAMMATORY AND REGULATORY PROFILE OF CYTOKINES IN THE PRESENCE OF *SCHISTOSOMA MANSONI* ANTIGENS IN PATIENTS WITH SEVERE ASTHMA

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Introduction: Some studies have shown that the infection with *Schistosoma* spp. or its products can prevent the allergic immune response by inducing a regulatory cells and cytokines, such as IL-10. The aim of this study was to evaluate the profile of inflammatory and regulatory cytokines produced *in vitro* by mononuclear cells of patients with severe asthma in the presence of *S. mansoni* antigens Sm29 and Sm29-TSP2**. Methods and Results:** Nineteen patients were included in this study to date: nine patients with severe asthma controlled or partially controlled with treatment (SAC) and ten patients with severe asthma refractory to treatment (SAR). The cultures of mononuclear cells stimulated with *Der p*1 were evaluated in the presence of Sm29 and Sm29-TSP2 antigens. The levels of the cytokines IL-10, IFN-γ and IL-13 were performed by ELISA and results are expressed in median (min-max) and pg/mL. We observed that individuals with SAC and SAR there was an increase in IL-10 production in cultures stimulated with Sm29 [SAC: 497 (15.6–1000); SAR: 248 (15.6–1000)] and *Der p*1+Sm29 [SAC: 641 (15.6–1000); SAR: 270 (15.6–1000)] compared to the unstimulated cultures [SAC: 15.6 (15.6–153); SAR: 15.6 (15.6–317)] and stimulated with only *Der p*1 [SAC: 15.6 (15.6–15.6); SAR: 15.6 (15.6–139)]. Additionally, individuals with AGR were also observed an increase in IL-10 levels in cultures stimulated with *Der p*1 + Sm29-TSP2 [100.8 (15.6–982)] compared to unstimulated cultures. Regarding the IFN-γ levels, we observed that individuals with SAC had an increase of their production in all stimulus [Derp1: 15.6 (15.6–1000), Sm29: 102 (15.6–1000);

Sm29-TSP2: 15.6 (15.6–1000); Derp1+Sm29: 757 (15.6–1000); Derp1+Sm29-TSP2: 113 (15.6-1000)] compared to the unstimulated cultures [15.6 (15.6–31)]. In individuals with SAR were also observed high levels of IFN-γ in the cultures stimulated with Sm29 [185 (15.6–1000)]; Sm29-TSP2 [15.6 (15.6–796)]; Derp1+Sm29 [414 (15.6–1000)] compared cultures unstimulated and stimulated only *Der p*1 [15.6 (11–39) e 15.6 (11–39), respectively]. However, there was no difference in IL-13 levels all groups evaluated. **Conclusion**: Despite of *S. mansoni* antigens have induced inflammatory cytokine, IFN-γ, in patients with severe asthma, also induced IL-10, which is an important regulatory cytokine. Therefore, further studies are suggested to identify other regulatory mechanisms that may be involved in the inflammatory response in asthma.

Financial support: PRONEX, CNPq

OP3-14

EVALUATION OF THE REACTIVITY OF SERA FROM RESIDENTS OF AN ENDEMIC AREA FOR SCHISTOSOMIASIS TO A PROTEIN IDENTIFIED IN THE PARASITE'S TEGUMENT.

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INTRODUCTION: The *S. mansoni* tegument induces different types of immune response on its definitive host, and so it is important to comprehend how specific antigen from the tegument is recognized by the host immune system. Our group have recently identified in the schistosomula tegument a protein named by us as "TTM29". In this study we analyzed the recognition of the recombinant form of TTM29 by sera from residents of an endemic area for schistosomiasis. **METHODS AND RESULTS:**. To evaluate the antigenicity of the recombinant antigen we performed a Western Blotting, using a monoclonal antibody against the histidine tag; sera from healthy individuals and sera from individuals infected with *S. mansoni*. The ELISA was done on a flat bottom plate sensitized with 1ug/mL of rTTM29 on Carbonate-bicarbonate Buffer (pH 9,6) at 4°C/16 hours. The plates were blocked with 10% of fetal bovine serum on phosphate buffer containing 0.05% of tween 20 (PBST) for 16h/4°C. The sera from health donors or from individuals living in endemic areas presenting negative or positive stool examination were evaluated on individual basis. Sera were diluted 1:100 in PBST and incubated for 2h at room temperature (RT). To detect antigen's recognition we used an anti-human IgG antibody conjugated to peroxidase (1:60000/1h/RT). TMB was used for color reaction and the data was acquired at 450nm.. The absorbance data were correlated to each individual burden determined by the Kato-Katz exam (4 samples, 18 slides). The Western Blotting showed that the rTTM29 was detected by the anti-histidine-tag antibody and also by the sera from infected individuals. In contrast the sera from health donor did not recognize the recombinant protein In the ELISA test 11% of the healthy donors did not recognize the recombinant antigen. 82% of the individuals living in endemic areas for schistosomiasis and with a positive stool examination recognized the antigen, while 53% of the individuals living in endemic areas with negative stool examination recognized the recombinant protein. Even after treatment with praziquantel, sera from individuals 30 (70%) and 180 (66%) days post-treatment recognized the recombinant protein. No correlation between the parasite burden and absorbance levels was observed. **CONCLUSION:** The ELISA test using TTM29 as antigen still need to be refined to better discriminate individuals living in endemic areas presenting stool positive examination from those presenting negative stool exams.

Financial Support: Fapemig, Proep/Cpqrr, CNPq, PapesVI-Fiocruz, Ripag

OP3-15

A BRIEF SUMMARY OF THE BRAZILIAN STRAINS OF *SCHISTOSOMA MANSONI* MAINTAINED IN THE LABORATORY OF MALACOLOGY OF OSWALDO CRUZ INSTITUTE/FIOCRUZ

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Introduction: Since 1940s differences in the susceptibility of intermediate hosts of *Schistosoma mansoni* to different strains of the parasite are known. In Brazil, a physiological adjustment between the snail and the local strain of the parasite was pointed out by Paraense and Corrêa (1963): the strains used in their study were isolated in 1959 from a patient with a chronic infection contracted from a single exposure to cercariae at Belo Horizonte, Minas Gerais State (BH strain) and in 1962, from 13 naturally infected snails from São José dos Campos, São Paulo State (SJ strain). Those strains were again obtained from the same localities from naturally infected snails: BH strain was isolated on May 13, 1985 from 11 *Biomphalaria glabrata* whereas SJ strain was isolated on 31 March 1982 from four *Biomphalaria tenagophila* specimens. Since then *S. mansoni* strains have been maintained at the Laboratório de Malacologia, IOC/FIOCRUZ, by passages through snails from the same breeding sites (laboratory colonies) and female Swiss albino mice. This study provides a summary of the use those strains in the last five years, and reports other eight *S. mansoni* strains also available for collaborative researches. **Methods**: Laboratories of different institutions were related and all biological material (feces with *S. mansoni* eggs, mollusks shedding cercariae and cercariae) donate to them was quantified. **Results:** From January 2011 to June 2015 there were donated feces of infected mice, roundly 120 snails shedding cercariae and 369 vials with cercariae (about 8 to 10,000 cercariae per vial), mainly of BH strain, to 20 laboratories from four research institutions (UERJ, UFRJ, UFF and FIOCRUZ). Other eight *S. mansoni* strains have been kept: two isolated from feces of patients born and grown up in *Biomphalaria straminea* exclusive area (EC strain, municipality of Picos, Piauí State and CM strain, Pau d'alho locality about 40 km far from São Lourenço da Mata, Pernambuco), one isolated from the naturally infected wild rodent *Oryzomys subflavus*, from Ceará-Mirim/ Rio Grande do Norte State and five isolated from infected specimens of *B. glabrata* from Belém/ Pará State (BE strain), Touros/ Rio Grande do Norte (CE strain), Januária/ Minas Gerais (JA strain) and São Sebastião do Passé (SS strain) and Teolândia (BA strain), both from Bahia State. **Conclusions**: The differences in susceptibility of snail populations to *S. mansoni* strains in addition to the use of the strains in different kinds of research that have been done along the years justify their maintenance.

Apoio: Fiocruz/POM

OP3-16

Schistosoma mansoni VENOM ALLERGEN-LIKE PROTEIN (SmVAL) 4, 13, 14 AND 18 RECOMBINANT EXPRESSION, PURIFICATION AND IMMUNOLOGICAL EVALUATION AS VACCINE AGAINST SCHISTOSOMIASIS

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Introduction: Recently described *Schistosoma mansoni* Venom Allergen-Like Protein (SmVAL) gene family encodes proteins that are either secreted (group 1) or intracellular components (group 2), pointed out as potential vaccine candidates. Secreted group 1 SmVAL4 and 18 were identified in cercarial secretions possibly participating in mammalian host invasion, while SmVAL7 transcript were localized in adult worms oesophageal glands suggesting a role in blood feeding. Although SmVAL function remains to be determined, data suggests they are interesting immune targets. **Objective:** The aim was to express and purify recombinant SmVAL4, 13, 14 and 18 to use them along with previously characterized SmVAL6 and 7 in a vaccine assay against schistosomiasis. **Materials and Methods:** Recombinant proteins were expressed in *E. coli* BL21, purified by niquel-affinity chromatography and used together with SmVAL6 and 7 to immunize female C57BL/6 mice in a 3-dose schedule. Control group received saline with Titermax Adjuvant in the first dose, while vaccinated group received 60 µg of total protein (10 µg of each SmVAL) with the adjuvant in the first dose and recombinant SmVALs in the subsequent doses (15-day interval). Twenty days after the third immunization, animals were challenged with 120 cercariae and forty-five days after that, animals were perfused for the recovery of worms to evaluate worm burden and liver separated for egg counting. Mice were bled one day after each immunization, challenge and perfusion to evaluate IgG production. **Results:** SmVAL4, 13 and 14 were expressed as inclusion bodies, while SmVAL18 was expressed in the soluble fraction. After refolding, SmVAL4, 14 and 18 remained soluble, while the majority of SmVAL13 precipitated. Circular Dichroism analysis revealed that soluble proteins display an ordered secondary structure, which resembles the three layer α-β-α-sandwich already resolved for SmVAL4. The proteins were used along with SmVAL6 and 7 to immunize mice and evaluate the immune response after challenge. Although SmVALs induced specific IgG production against each antigen except for SmVAL7, the protection level achieved was only 7%. A small decrease, although non-significant, was observed in egg counts in the immunized group. **Conclusion**: SmVALs as tested here, although secreted during intra-mammalian host invasion and feeding processes, were

not protective against cercarial challenge in the murine model of schistosomiasis.
Financial support: FAPESP

OP3-17

RECOGNITION PROFILE STUDY OF *SCHISTOSOMA MANSONI* PROTEINS BY THE SERUM OF INDIVIDUALS FROM SCHISTOSOMIASIS ENDEMIC AREA

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Introduction: Despite the efforts to control schistosomiasis, it is still highly prevalent in the world. The treatment is performed with Praziquantel, only drug available. Although it is effective in reducing severe form of the disease, a high reinfection rate remains in endemic areas, added to notification of new infection cases. In addition, there are reports of less susceptible parasites to drug. Therefore, new interventions to control and even eliminate the schistosomiasis are needed. The association of vaccination with chemotherapy would be a strategy to control the disease. It is also necessary to develop new diagnostic methods to detection of low intensity infections and monitoring of post treatment cure.

Methods: By immunoscreening of *Schistosoma mansoni* adult worm proteome combining bidimensional electrophoresis and Western blotting (WB-2D) using, for the first time, human serum of infected and naturally resistant individuals from a schistosomiasis endemic area, we have recently identified 47 immunoreactive proteins. But all have cytoplasmic localization. Since the apical membrane of the adult worms and schistosomules tegument is the interface to the host's immune system, we started using protein extraction protocols able to enrich our protein extracts with parasite cell membrane proteins, either from the whole worms or only from the tegument.

Results: The presence of such proteins in these new extracts was demonstrated by detection of Sm29 by Western blotting and also by shotgun proteomics identification of several *S. mansoni* proteins previously described as membrane-associated, membrane structural or membrane enzymes of the parasite tegument. After performing the WB-2D experiments with new protein extracts and serum of infected and naturally resistant individuals from schistosomiasis endemic area, we obtained a different spots recognition profile for each serum, and spots that have reacted only to a particular sample serum. The immunoreactive spots of interest, because they are promising targets for the development of schistosomiasis vaccine or diagnostic test, were identified by mass spectrometry.

Key Words: Immunoproteomics, tegumental proteins, *Schistosoma mansoni*

Supports:

Programa Estratégico de Apoio à Pesquisa em Saúde (PAPES VI - FIOCRUZ)

CNPq/PROEP-RIPAg/CPqRR/FIOCRUZ
Rede de Plataformas Tecnológicas/FIOCRUZ-Subunidades RPT02D and RPT02A

APPLICATION OF RANDOM AMPLIFIED POLYMORPHIC DNA-PCR (RAPD) TO DETECT GENETIC POLYMORPHISMS IN DIFFERENT STAGES OF THE *SCHISTOSOMA MANSONI* LIFE CYCLE AFTER *IN VIVO* TREATMENT WITH ESSENTIAL OIL AND SESQUITERPENES COMPOUNDS OF *BACCHARIS TRIMERA* (LESS DC)

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Introduction: Currently, praziquantel (PZQ) is the only available drug for treatment of schistosomiasis, well tolerated by patients, with good cure rates, ranging between 60 and 90%. However, with the continuous use in chemotherapy programs, there is a significant risk that drug resistance could be developed. Consequently, it is imperative to develop new effective antischistosomal drugs. In recent years, natural products have evidenced an important role in the discovery of new compounds for the treatment of parasitic diseases, including schistosomiasis. Additionally, the current knowledge about the genetic variability of the parasite and the use of molecular tools have proven to be effective to identify new targets that could be of particular interest in several schistosome life cycle stages. Molecular biology techniques as Random Amplified Polymorphic DNA – Polymerase Chain Reaction (RAPD-PCR) have been used to detect genetic polymorphisms in *S. mansoni*. The aim of this study was to identify genetic polymorphisms between males and females worms after *in vivo* treatment using RAPD-PCR. **Methods:** For *in vivo* assay, mice were allocated in five equal groups of five. The animals was treated after 03, 21 and 56 days post infection (dpi) with single dose of essential oil, sesquiterpenes compounds of *B. trimera* and PZQ. Five arbitrary primers were used to RAPD-PCR assay. **Results:** Of the five used primers only AC-3 and OPA-2 generated more polymorphic DNA bands within males and females worms for the different treatments in all infection periods. **Conclusion:** In summary, it was observed that only the two described primers, produced a few genetic polymorphisms, demonstrating that the treatment with those drugs didn't induce genetic significant alterations.

Key-words: *B. trimera*, *S. mansoni*, Treatment, RAPD

UNDERSTANDING THE MAPKs SIGNALING PATHWAYS IN *SCHISTOSOMA MANSONI*

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Eukaryotic protein kinases (ePKs) are key regulators of cellular function and act phosphorylating transcription factors causing changes in gene expression, thus in cellular behavior. The characterization of mechanisms and molecules involved in cell signaling are essential to understanding the biology of the *Schistosoma mansoni* and its ability to adapt to different hosts. Additionally, *Schistosoma* ePKs are proposed as potential targets for the development of new anti-schistosome drugs. The *S. mansoni* genome encode 252 ePKs, corresponding to 2% of the predicted proteome, nonetheless, only 24 have any experimental evidence. Due to rare data availability, the main motivation of this study is to contribute to ePKs experimental characterization by the identification of genes target of regulation of MAPKs and its phosphorylation counterparts. Therefore, five selected genes from the MAPK signaling pathway (SmCaMK2, SmERK-1, SmERK-2, SmJNK, Smp38) and unspecific (GFP) and negative controls were depleted by RNA interference in schistosomula, including three biological replicates. After two days of culture, total RNA extraction, cDNA synthesis, and quantitative PCR (RT-qPCR) was performed. For all genes selected, we observed approximately 75% reduction on transcript levels, excluding SmERK-2. RNA-Seq libraries were prepared with RNA derived from knockdown parasites according to the *Truseq stranded mRNA Library Prep* protocols and were sequenced on *Illumina HiSeq 2500* platform. Identification of gene targets of regulation of each tested kinase are being processed by transcriptome comparisons after RNAi. In parallel, total protein resultant from knockdown parasites were extracted and sent to the proteomics platform - FIOCRUZ/PR for enrichment in phosphorylated peptides and subsequent identification of phosphorylation sites by mass spectrometry. Here, we aim to expand the knowledge around the genes target which are regulated by SmCaMK2, SmERK-1, SmERK-2, SmJNK and Smp38, as well as, to identify those MAPKs counterparts' using phosphoproteome. This work will enable a better understanding of these pathways, elucidating functional ePKs roles in parasite survival, reproduction and adaptation.

Financial support: CAPES; FAPEMIG; CNPq, CPqRR-FIOCRUZ.

EVALUATION OF PROTECTIVE RESPONSE INDUCED IN MICE BY GENE IMMUNIZATION PROTOCOL USING TTM48, A *Schistosoma mansoni* TEGUMENT ANTIGEN.

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INTRODUCTION: Schistosomiasis control is based in chemotherapy with Praziquantel. This strategy has been shown ineffective in endemic areas due to high reinfection rates. Therefore the development of a vaccine is needed as an alternative tool to control the disease. One of the sources of antigens to be used in a vaccine formulation is the parasite tegument. In this study we evaluated the ability of the gene encoding TTM48, a protein present in the tegument of the *S. mansoni* schistosomula, to induce protection in mice. **METHODS AND RESULTS:** A synthetic gene optimized for expression in *Mus musculus* cells was subcloned into the pCDNA3.1V5/HIS plasmid. The construction was inserted in XL1Blue bacteria strain. The presence of the gene in individual clones was confirmed by digestion and sequencing using the Sanger method. The immunization protocol consisted in four intramuscular doses of a vaccine containing 100µg of pCDNA3.1V5/HIS or pCDNA3.1V5/HIS/TTM48 in a fifteen-day interval regimen. Five days before the first immunization dose mice received intramuscularly 6.8 µg of cardiotoxin from *Naja mossambica mossambica* (Sigma). Fifteen days after the last dose, mice were percutaneously challenged with approximately 100 cercariae of the *S. mansoni* LE strain. On days 47^{th}, 48^{th} and 49^{th} post-infection stool examination was performed to determine egg burden in feces. Fifty days after infection, mice were perfused to determine the level of protection achieved. Vaccine formulation with pCDNA3.1V5/HIS/TTM48 reduced the parasite burden by 45%, the number of eggs in the feces by 79% and the number of eggs trapped in the intestine and in the liver by 36% and 33%, respectively. To evaluate the immune response induced by vaccine, the sera from immunized mice were obtained and specific IgG levels were determined by ELISA. Cellular characterization was performed in spleen cell culture by Flow cytometry analysis. Immunization with pCDNA3.1V5/HIS/TTM48 induced significant increase in specific IgG levels after the second immunization dose. An increase in the percentage of activated $CD4^+$ cells and $CD4^+$ effector and memory cells was observed in immunized animals. **CONCLUSION**: TTM48 is a potential candidate to be used in a vaccine formulation against schistosomiasis.

Financial support: CNPq, PapesVI/Fiocruz, Proep/CPqRR.

OP3-21

HEDGEHOG AND IL13 PATHWAYS ORCHESTRATE SCHISTOSOMIASIS MANSONI FIBROSIS

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Introduction: Schistosomiasis mansoni is a major cause of liver fibrosis and portal hypertension. IL13 and Hedgehog (Hh) increase in schistosomiasis, regulating stellate cell activation and alternative activation of macrophages (M2). Our **aims** were to investigate if there is cross-talk between IL13 and Hh in murine and human schistosomiasis. **Methods and Results:** Male Balb/c wild-type mice (n=9), IL13Rα1$^{-/-}$ mice lacking IL13 signaling (n=9) and TKO (IL-10$^{-/-}$, IL12/23(p40)$^{-/-}$, IL13Rα2$^{-/-}$) mice with constitutive IL13 activity (n=6) were infected with *Schistosoma mansoni*. Uninfected wild-type male Balb/c mice (n=5) were controls. To investigate the effect of Hh on M2 polarization, primary murine kupffer cells (pmKC) were isolated from Smoothened$^{flox/flox}$ mice (Smo$^{flox/flox}$) by elutriation. Smo was knocked down using an adenovirus harboring Cre recombinase (or GFP control). 87 wedge liver biopsies from schistosomiasis patients (low fibrosis n=15, severe fibrosis n=72), 22 biopsies from noninfected transplant donors, 33 snap frozen wedge liver biopsies from patients with severe schistosomiasis and from 4 transplant donors were evaluated. IL13, Hh pathway

(Ihh, Shh, Gli1, Gli2, Ptch1), fibrogenesis (Col6a1, aSMA), and M2 markers (Chi3l3, Arg1, Fizz1) were assessed by qRTPCR, Western blot and immunohistochemistry. Fibrosis was evaluated by Sirius red histochemistry and hydroxyproline content. This study was approved by the animal and human ethics committees of NIH, Duke, and UFMG. Infected TKO mice had more collagen, myofibroblasts, M2 macrophages and Hh pathway activity than infected wild-type mice, infected IL13Rα1$^{-/-}$ mice, and non-infected controls. Infected IL13Rα1$^{-/-}$ mice had lower expression of Ihh, Shh, Gli1 and Gli2 than uninfected controls, suggesting that IL13 promotes Hh signaling. Hh pathway activity correlated with collagen accumulation, M2 marker expression, and myofibroblast activation. Deletion of Smo in pmKC abrogated M2 polarization. Patients with severe schistosomiasis had increased IL13 and Hh pathway activity and Hh signaling correlated with collagen deposition and fibrosis staging by ultrasound. Activation of hedgehog pathway also correlated with the severity of portal hypertension. **Conclusions:** IL13-mediated activation of Hedgehog promotes M2 polarization and liver fibrosis in schistosomiasis.

Financial support: CNPq, CAPES, NIH.

OP3-22

TARGETING EPIGENETIC REGULATORS TO CONTROL SCHISTOSOMIASIS

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Introduction: Schistosomiasis is a chronic disease that affects 240 million people in the world. The current strategy for the treatment and control of schistosomiasis is the use of Praziquantel, the only available drug. The development of new drugs is therefore mandatory. The new strategy that we have chosen is to target the enzymes involved in epigenetic modifications of the chromatin, such as acetylation and methylation of histones. We have previously shown that acetylation can serve as an affective drug target. In the present work, we show that targeting one major histone demethylase LSD1 from *S. mansoni* is also a valid therapeutic approach. **Objective:** Test several LSD1 inhibitors as a new strategy to control Schistosomiasis. **Methodology:** Drug screening of *S. mansoni,* by *in vitro* culture of adult worms or the larval stage of schistosomula; Viability estimation and quantification by ATP measurements; Confocal Laser Scanning Microscopy of the adult worms and quantitative RT-PCR. **Results:** Several compounds that specifically target LSD1 have been tested against schistosomula and adult worms. We have identified two potent compounds showing high toxicity leading to complete mortality of the immature forms of the parasite, after 48h at a dosage of 10-25 uM. Adult worms were also sensitive to the same compounds, however after longer period (72h) of incubation. Egg laying by adult female schistosomes was significantly affected by the LSD1 inhibitors. **Conclusions:** So far, we have validated two LSD1 inhibitors as a novel and promising strategy to control schistosomiasis. Their molecular mechanisms of action have also been pursued.

Acknowledgements: Thanks to Sr. Paulo and the Malocology lab at IOC/FIOCRUZ – RJ.

Key Words: Epigenetics, *Schistosoma mansoni* and Therapeutics.

ADAPTATION OF *SCHISTOSOMA MANSONI* IN THE SCHISTOSOMULUM STAGE *IN VIVO* AND *IN VITRO*

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INTRODUCTION: Schistosomula of *Schistosoma mansoni* are widely explored in a broad range of experimental approaches, aiming to develop new drugs and diagnostic methods. In present work, schistosomula obtained *in vivo* and *in vitro* were compared in their ability to capture fluorescent probes for specific internal structures or surface membranes. The parasite was also incubated *in vitro* in the presence of the portal and peripheral serum of the hamster to simulate the environment of the host. METHODS AND RESULTS: The probes employed to stain membrane, lysosome, auto-fagossome, glutathione and mitochondria showed similar staining in the parasite obtained through mechanical transformation (Mech) and also active skin penetration *ex vivo* (Skin). Differences were observed when those parasites were compared to another obtained *in vivo,* by migration from skin after transcutaneous infection. The membrane permeability was shown increased in these parasites. Schistosomula were also cultured in different times, 3hours and 12hours, in presence of portal serum of hamster (SPO3h and SPO12h), and peripheral serum (SPE3h and SPE12h). The mRNAs were used to prepare whole transcriptome libraries and, furthermore, sequencing on 5500 *SOLiD*^{TM} Applied Biosystems platform. On Average, 15 million of reads were produced for each sequenced sample. A list of 103 genes differentially expressed was generated from the comparison between SPO3h *versus* SPO12h and, from them, 58 genes remained after filtering by a similar list of overlapping genes from the comparison between SPE3h *versus* SPE12h. According to the annotation data, the differentially expressed genes in schistosomula after 12 hours in contact with portal serum are related to different processes: membrane transport, response to stress, cell signalling, cytoskeleton, protein turnover, nucleotide synthesis, cellular differentiation, and others. CONCLUSIONS: The data from mechanical and skin comparison suggest that in schistosomula *in vivo* the metabolism is more active in cells of the surface and, further, there is a huge turnover of molecules in the surface of the parasite, involving internal molecules and increasing in immunogenic molecules release. The differentially expressed genes highlighted a set of processes important to the parasite adaptation in the portal environment, also to the development of larval stage to adult worm.

CNPq/CsF – CPqRR – Plataformas Tecnológicas FIOCRUZ.

OP3-24

"INFLUENCE OF INFECTION BY *Schistosoma mansoni* AND GEOHELMINTHS IN POSITIVITY PROFILE FOR THE SKIN PRICK TEST IN CHILDREN IN THE METROPOLITAN REGION OF RECIFE, NORTHEAST, BRAZIL"

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INTRODUCTION: Asthma is a disease associated with genetic predisposition and environmental factors that affect the human airways. Parasitic infections induce Th2 cell and modulate the symptoms of asthma. OBJECTIVE: The aim of study was analyze the modulation of parasitic infection in the skin prick test (SPT) profile in children with asthma between 2 and 14 years old from metropolitan region of Recife, Pernambuco. METODOLOGY: Children between 2 and 14 year old were submitted to a parasitological survey using the Hoffman, Pons e Janer and the Kato-Katz method. The standardized questionnaire *International Study of Asthma and Allergies in Childhood* was applied to collect informations related to asthma. The SPT was applied to the forearm Reading the halos after fifteen minutes using extracts of *Dermatophagoides pteronyssinus* (DP), *Blomia tropicalis* (BT), *Blatella germânica* (BG), *Periplaneta americana* (PA), fungus and cat epithelium (EP6). RESULTS: Sixty-two children were registered, 35 (65.17%) classified as having asthma by ISAAC. Between asthmatics 11 (31.42%) were infected with parasites and 24 non-infected (68,58%). Among the non-asthmatic children (n=27, 43,5%), 25 were infected (92,6%) and 2 non-infected (7.4%). The parasites identified in asthmatic children were *Enterobius vermicularis* (n=2, 18,18%), *Ascaris lumbricoides, Trichuris trichiura and Ancylostoma sp (*n=1, 9,1%), *Giardia lamblia* (n=5, 45,4%), *T. trichiura* and *Ancylostoma sp* (n=1, 9,1%), *T. trichiura and A. lumbricoides* (n=1, 9,1%), *T. trichiura* (n=1, 9.1%); within the non-asthmatic were *A. lumbricoides* (n=3, 12%), *G. lamblia* (n=10, 40%), *T. trichiura* (n=6, 24%), *Schistosoma mansoni* (n=1, 4%), *Ancylostoma sp* (n=2, 8%), *S. m*ansoni, *T. trichiura* e *Ancylostoma sp* (n=1, 4%), *T. trichuris*, *A. lumbricoides* and *Ancylostoma sp* (n=2, 8%). The SPT was positive in 18 children (29,0%), with 7 infected (11,3%) and 11 not infected (17,7%). The positivity profile of the SPT were 2 children positive for DP (11,1%), 1 for BT (5,5%), 11 for DP and BT (61,1%), 1 for DP, BT and fungus (5,55%), 1 for DP, BT, BG, PA and EP6 (5,5%), and 1 for BT, BG and PA (5,5%). CONCLUSION: The parasitic infection was more frequent in non-asthmatic children. It was not possible to verify alterations in the positivity of the skin prick test among asthmatic children and the association with parasitic infections. The most frequent allergens in the positivity of the SPT was *D. pteronyssinus* and *B. tropicalis.*

Keywords: Asthma; *Schistosoma mansoni*; Geohelminths; Skin Prick Test.
FINANCIAL SUPPORT: CHAMADA UNIVERSAL - MCTI/CNPQ Nº 14/2012 processo 478.508.201-23 MCTI/CNPq/MS-SCTIE-Decit Nº 40/2012 - Pesquisa em Doenças Negligenciadas processo 478.508.201-23

OP4-01

THE UTILIZATION OF A CARTOON IN THE HEALTH EDUCATION PROCESS ABOUT SCHISTOSOMIASIS

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Introduction: The work of health education professionals can be enriched by the use of playful learning resources, Relevant for communication between people and effective in the process of teaching and learning.

Objective: Considering these aspects, a digital animation with the theme schistosomiasis was developed in order to stimulate learning about the disease in endemic municipalities.

Methods: The animation was built in Adobe Flash and Adobe Premiere 2D and has duration of 16'13. Based on the book story from Virginia Schall “The Lagoon Spell” has as its storyline a boy who moves to the city and make new friends. With these friends and as a leisure option they attend a lagoon, which is known from all people as "enchanted lagoon" because all people that entering it get sick and/or backward children in school. Throughout history, there is a spell of myth deconstruction and an. understanding of schistosomiasis cycle, as well as its social and cultural aspects. The drawing was displayed for nine classes of elementary education at five schools in two municipalities endemic for schistosomiasis in Minas Gerais - Jaboticatubas and Malacacheta.

Results: A questionnaire with 12 closed questions was answered by 218 students in order to validate and verify the acceptance and understanding of design. The average age of the population was 11 years. The design was considered excellent / good by 97.2% of students. They identified the disease schistosomiasis as portrayed; 98.6% were able to assimilate that the snail is the intermediate host of the parasite. When asked what would be the site of transmission 99.1% of them identified the lagoon water; 84.4% reported that the lagoon was not bewitched, but that was contaminated; 97.2% of them said that the stool test is important for diagnosis and 97.7% reported that xistose have treatment; 96.3% of them reported that avoid water activities where you have the transmitter snail prevents disease transmission.

Conclusion: The results indicate the a good acceptance by the target public and show that the design can be an important pedagogical resource in the educational process, helping the endemic disease control programs especially when developed at school. Recognition of the snail intermediate host and the understanding of the parasite cycle by 98.6% of students from endemic areas, indicates that this material helps in

understanding the local health reality avoiding confusion with other infectious diseases especially dengue, whose knowledge is widely distributed in schools and the media. This digital animation is available to be downloaded from the site of our group "xistose.com" and "pide.cpqrr.ficruz.br", the Integrated Program of Schistosomiasis site (PIDE).

Financial support: FAPEMIG

Keywords: digital animation, ludic, education, schistosomiasis.

PRESENCE OF SUSCEPTIBLE MOLLUSCS IN A PUBLIC DAY CARE IN ARACAJU, SERGIPE

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Introduction: *Schistosoma mansoni* is the main etiological agent of Schistosomiasis, a parasitic disease that found in Brazil excellent conditions for its growth and development. Schistosomiasis spreads over large rural areas and undeveloped cities where basic sanitary conditions are absent. Contamination of water sources by human faeces contributes in the maintenance of its transmission cycle. State of Sergipe in Brazil is an endemic region for schistosomiasis. This research work was performed in a Day Care center in Aracaju, in a district named Inacio Barbosa, which takes care of children in the age group of 6 months to 5 years.

Method: In a single day 87 molluscs were collected at the Day Care center. These specimen were taken to the Laboratory of Entomology and Tropical Parasitology (LePat) of the Federal University of Sergipe (UFS), where they were identified as snails belonging to the genus *Biomphalaria*. Using light exposure, the snails were examined for the presence of cercariae. This exam was performed on a daily basis for a period of 40 days. Then, the molluscs considered non infecting in the previous test were smashed between two petri dishes in order to confirm the absence of the larval form (cercariae). Fifteen snails were imersed in fixing solution to preserve the internal structures and proportion of organs for morphological identification. Finally dissection of snails belonging to the genus *Biomphalaria* was carried out to identify their specicies by means of Paraense and Desland techinique.

Results: 6 of 87 collected snails (7%) were identified as *Physa sp*. All remaining 81 snails (93%) were identified as *Biophalaria glabrata*. None of the *B. glabrata* specimens were infected by *S. mansoni* which means that none of them released cercariae. It was not possible to carry out faecal exams of the children visiting the Day Care center due to the restrictions imposed by the center incharge. Nevertheless, educational lectures were ministered for the children, with the aim of informing them of the disease and its prevention.

OP4-03

EDUCATION FOR SCHISTOSOMIASIS PREVENTION IN BRAZIL

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Schistosomiasis is a parasitic disease that affects at least 210 million people worldwide, causing 200 to 300 thousand deaths per year, in 78 countries, mainly in developing nations comprising as a substantial public health problem (WHO, 2015). In Brazil, some areas show prevalences over 20 % and migrations are spreading the disease. At least 60 % of the Bahia cities are endemic, mainly in low-income areas.

Control measures such as mass treatment and water supply are not completely effective, particularly because of sanitation shortage. Brazil is considered the 7th world economy but is the 112th in sanitation among 200 nations and *circa* 25 % of the Brazilians lack access to improved sanitation.

Health Ministry recommends community engagement in prevention programs, but it has been limited. Education interventions based on leaflets and lectures tend to be poorly attractive, particularly for children and teenagers.

The Laboratory for Parasite Biology at Fiocruz (Oswaldo Cruz Foundation in Bahia) created and executes a project aimed to promote health through science popularization termed "Science on the Road: education and citizenship". The team uses a bus with a mobile-lab in its rear and different strategies to spread hygiene practice and infection preventing attitudes, mainly focusing parasitic diseases highly endemic in poor communities such as schistosomiasis.

Different approaches are employed for each area, depending on the population age, educational level and most prevalent diseases. The events include ludic/interactive activities such as educative electronic or traditional games, microscopes to display parasites, highly illustrated posters, videomicroscopy showing *Schistosoma* developmental forms including ova, miracidia, cercariae and adult worms. We also use a informal, illustrated manual named How to Avoid Infections and cordel books.

Vectors, including *Biomphalaria* sp. embedded in transparent resin and biscuit resin-made pathogen models are handled by the population during the exhibitions. Models of houses crafted in recycled material are used to present infection-risky behaviors and conditions as well as strategies to avoid them. The community health agent course for teenagers was designed to empower students to propagate information on preventive measures within schools and neighborhoods. This comprises a promising strategy using the outreaching and motivating effects of enthusiastic kids to promote population engagement in disease control.

Apoio: CNPq; CAPES; FAPESB; SECTI; PRONEX

VANTS COMO INSTRUMENTO DE INQUÉRITO MALACOLÓGICO

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An important aspect in the control and determination of Schistosomiasis risk areas is the mapping of the occurrence of Biomphalaria. This work proposes a malacological survey instrument using a small UAV (Unmanned Aerial Vehicle) for mapping Biomphalaria breeding. UAVs, popularly known as "drones" are vehicles that can reach difficult access places. It is equipped with environmental sensors and cameras. An UAV is able to identify on the fly the existence of the snail. The system is self-controlled (no need for human control) and writes missions and transmits them in real time to agents near the flight area. The system maps the occurrence of Schistosomiasis areas and it has been integrated with geospatial technology and satellite images from Geosere-UFRPE (www.dtr.ufrpe.br/geosere/). There are two categories of UAVs: (1) the fixed-wing and (2) the rotary-wing (or propeller, and a VANT with four of them is also called 4-engine drone). For this study it has been used a 4-engine one, because it requires a good flight stability for obtaining the images. It is necessary for sharply identify the elements of the image. Rotary-wing UAVs are generally small ones. They have a motor for each screw and they use a cross structure where each motor is fixed to one end of this structure. UAVs are equipped with onboard computer, responsible for turning the control of the engines as well as the execution of algorithms that stabilize the flight, reading sensors, data acquisition and processing from the environment in which they are flying. Data is collected from various sensors attached to the vehicle. The processing of the collected data by UAVs can be done in two different ways: (1) embedded processing, where the processing takes place along with the reading of runtime data and on board; and (2) the computational processing on a server, where the processing is done after collection in a different computer from the one that collects the data. This work intends to present a new methodology to identify the Schistosomiasis intermediate host. It also intends to conduct a study of abiotic variables collected by the various sensors attached to the vehicle. The data from these sensors will feed a computer model that is able to store historical data. This model will be able to suggest locations for future analysis.

OP4-05

SPATIAL MAPPING OF SNAILS FOCI SCHISTOSOMIASIS TRANSMITTERS IN BAIXADA OCIDENTAL MARANHENSE - SÃO BENTO CITY

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Introduction: The schistosomiasis is a parasitic infectious disease caused by helminth *Schistosoma mansoni.* The cycle of this parasite has two hosts: midway, *Biomphalaria* genus of snails and definitive, men and rodents. In Maranhao an endemic area for the occurrence of this disease is the Baixada Maranhense, place conducive to the occurrence of these snails with absent or poor sanitation, and other factors that influence the transmission. In this perspective the aim of this study was to map outbreaks of these snails in São Bento. **Methods and Results**: Seventeen districts were visited in the urban area of the municipality in which the snails were collected using a manual technique, then stored in plastic bags, labeled and transported to São Luís. There they were placed in a glass aquarium with dechlorinated water and fed on lettuce leaves. In the laboratory, they were analyzed for the elimination of cercariae *S. mansoni* and the level was identified to the species. From the districts that hand been visited were georeferenced nineteen points, distributed in eight districts. All collection points were negative for *S. mansoni.* As for the specific identification it was possible to confirm the presence of *B. glabrata* and *B. straminea*. The mapped neighborhoods were visibly linked to poor housing: sanitation, infected persons, the presence of large populations harboring limnic and a big population of transmitters molluscs. This among others aspects contribute increasingly, for schistosomiasis transmission in the city. **Conclusion:** The negative results for *S.mansoni* does not mean that those breeding cannot become foci of transmission of the parasite. Currently, few environmental improvements or sanitation have been carried out in the municipality of São Bento in order to minimize the occurrence of schistosomiasis.

Considering the results obtained and the aspects related to the transmission of schistosomiasis, the mapping has great relevance because it identifies the locations of intermediary *S.mansoni* hosts for the year 2012/2013, in order to assist other studies on the epidemiology of this parasitosis and signals the need for related improvements to the living conditions of the population.

OP4-06

USE OF MOBILE TECHNOLOGY FOR STUDY OF SCHISTOSOMIASIS

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Introduction: Public health and environment are influenced by spatial occupation patterns. Therefore, the use of GIS techniques for the analysis of the spatial distribution of health problems allows to determine risk areas and define situations that concentrate most vulnerable population fractions. The spatial approach by integrating socio-economic and environmental data promotes the interrelationship of information from various databases. The identification or prediction of population groups in risk areas is a key initiative for the detection of priority groups for adequate allocation of resources, increasing the efficiency of use of public efforts. Mobile technology using smartphones and tablets can be applied to collect, characterize and analyze more efficient and faster data obtained in the field. This study used the Epi Info software to gather data from field records and socioeconomic surveys to generate databases which serve as the basis for creating spatial distribution maps of schistosomiasis. **Methods**: Models of field records and socioeconomic surveys were obtained from the Laboratory of Intestinal Parasites, Schistosomiasis and Malacology (LPIEM) of the Evandro Chagas Institute / SVS / MS, transformrd in digital files fields for "photo and geographic coordinates" were added. **Results**: The total of 206 socioeconomic surveys and 107 field records were registered using the Epi Info on mobile phones and tablets with Android system in the states of Maranhão and Pará. **Conclusion**: The application of this technology demonstrated an easier way of collecting data than the conversion of field records and / or inquiries in the traditional way (paper) to digital format, reducing errors in filling out the digital forms. In addition the use of digital records reduces the volume of paper, typing and printing costs and increases the speed and efficiency in the field by exporting collected data to spreadsheets, enabling database creation and importation into a Geographic Information System for spatialization and data analysis. This technology is being implemented in the LPIEM and was presented in meetings and courses in order to show and encourage the use in some municipalities of the Pará state for evaluation. **Funding**: CNPq # 149440 / 2014-6 and Fapespa # 176 / 2014.

OP4-07

EVALUATING IMPACT OF EDUCATIONAL ACTIONS ON SCHISTOSOMIASIS PREVALENCE AMONG SCHOOLCHILDREN IN THE MUNICIPALITY OF MALACACHETA, MINAS GERAIS, BRAZIL

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Introduction: Schistosomiasis is highly prevalent in school-age children. Sanitation and treatment are the most effective control measures, being more sustainable if combined with educational actions (EAs). However, few studies have evaluated the role of EAs in control. This study evaluates the use of EAs, combined with diagnosis and treatment, in schoolchildren in the endemic municipality of Malacacheta (MG), in reducing infection and expanding knowledge of the disease.

Methods: A questionnaire was applied in April 2013 to evaluate knowledge of schistosomiasis before parasitological survey (PS) and EAs. The first PS, in May 2013, was followed by selective treatment (July 2013) and PS to assess cure 45 days later. Eight schools were paired by *S. mansoni* infection rate, area (rural or urban) and number of pupils enrolled; and randomly allocated to form the experimental (EG) and control (CG) groups, with and without EA, respectively. Teachers at the four schools in the EG were offered a refresher course in schistosomiasis in August 2013, and they conducted EAs with 6th to 8th grade pupils for three months. Two PSs were performed one year and two years after the first treatment (July 2013) to monitor infection among pupils in the two groups. Selective treatment was done three times in the course of the study, once after each PS. Changes in the pupils' knowledge about the disease were evaluated by re-applying the same questionnaire at four points (at 1 and 6 months, and 1 and 2 years).

Preliminary Results: Data are given for only a cohort of 260 pupils who took part in the four PSs, at four of the eight schools studied. Of these, 128 were in the CG and 132, in the EG. At the baseline PS, *S. mansoni* infection rates were 28.1% (CG) and 28% (EG), with no significant differences between the groups. Treatment adherence was 91.7% (CG) and 97.3% (EG). Adherence to cure PS was significantly higher among pupils in the EG (92%) than in the CG (58.3%). Pupils in both groups tested 100% negative after treatment. Infection rates decreased significantly at the two subsequent tests, in 2014 and 2015, in both EG (6.1% and 1.5%, respectively) and GC (5.1% and 1.6%, respectively), with no difference between them.

Conclusion: These results suggest that the three rounds of treatment significantly reduced infection rates in both groups. However, it is not yet possible to make a reliable assessment of the role of EAs on either infection or acquisition of knowledge about the disease, because this analysis did not include all the schools participating in the study, nor the information gathered in the questionnaires.

Financial support: Papes VI Fiocruz/CNPq, PROEP/LECEG/IOC , CAPES.

OP4-08

FRESHWATER GASTROPODS AND ASSOCIATED HELMINTHS FROM THE BAIXADA MARANHENSE MICROREGION, MA, WITH EMPHASIS ON SCHISTOSOMIASIS TRANSMITTERS

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Introduction: The aim of this study was to survey freshwater gastropods in the Baixada Maranhense Microregion, MA, considered a low endemic area for schistosomiasis. **Methods:** A qualitative survey occurred from November 2011 to July 2012 in 21 municipalities of Baixada Maranhense Microregion and in two neighboring municipalities, whereas a quantitative study was carried out in four of these municipalities (Palmeirândia, Pedro do Rosário, São Bento and São Vicente Férrer) from July 2012 to July 2014, every three months. Larval trematodes associated with collected mollusks were also investigated. **Results:** In the qualitative study, five snail families were collected (Ampullariidae, Ancylidae, Planorbidae, Physidae and Succineidae) in 176 biotopes, and six out of 15 species collected were reported for the first time for Maranhão state. As for the schistosomiasis vectors, *Biomphalaria glabrata* was found in five municipalities (Bacurituba, Peri-Mirim, Pinheiro, São Bento and São Vicente Férrer), whereas *B. straminea* in nine (Arari, Conceição do Lago Açu, Igarapé do Meio, Monção, Pedro do Rosário, Penalva, Pinheiro, São Bento and Vitória do Mearim). These species were found in sintopy in Pinheiro and São Bento. Cercariae of *Schistosoma mansoni* were found in samples of *B. glabrata* in São Bento (October, 2012) and São Vicente Férrer (July, 2014). The family Planorbidae and the species *B. straminea* had higher abundances. Overall species abundances were higher in July 2012, during the winter. Temperature and daily rainfall positively influenced the abundance of *B. glabrata.* Most species were categorized as frequent or constant. There was no significant variation in the frequency of freshwater gastropods among municipalities or among habitat cathegories. The four investigated municipalities had low diversity with dominance of some species. **Conclusions:** Baixada Maranhense Microregion is epidemiologically important for schistosomiasis transmission, due to environmental and socio-economic factors that continue to favor the transmission of this disease, in addition to the occurrence of two intermediate hosts of *S. mansoni*, particularly *B. glabrata*, which was found naturally infected. This work, pioneer in the state of Maranhão, helps to guide future studies aiming to promote the health of local population and to increase knowledge on the biodiversity of that important northeastern Brazilian ecosystem.

Support: Instituto Oswaldo Cruz-Fiocruz, Capes, Decit.

OP4-09

QUALITATIVE ANALYSIS OF PRINTED EDUCATIONAL MATERIALS (MEIS) ON SCHISTOSOMIASIS USED IN HEALTH EDUCATION IN ENDEMIC AREAS

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Introduction: The education and health communication using various strategies to inform and mobilize people in order to participate in the collective health care process and practice social responsibility take preventive practices and change risky behaviors. The Printed Educational Materials (MEIs) - posters, leaflets and booklets - are tools of educational strategies.

Objective: to evaluate Printed Educational Material (MEIs) on schistosomiasis produced at Federal, State and Municipality levels in Brazil, emphasizing their inclusion in health education.

Methods: the education material was collected during the period of 2011 to 2014 and subjected to qualitative analysis, considering categories such as format, parasite, intermediate host, definitive host (patient) and disease.

Results: out of the 60 MEIs analyzed, only three did not report on risk activities and 41 indicated more than one popular name for the disease, allowing increasing audience and targeting population in different areas. For many educational materials the biological cycle was missing or incorrect. The snail, intermediate host, was incorrectly illustrated with use of stereotypical images and the little attention was given to stool examination for diagnosis.

Conclusion: most of the MEIs had incorrect content, which might prejudice their impact on health education, because they do not reflect the reality in endemic areas.

Financial support: Fapemig

Keywords: Schistosomiasis, Health Education, Printed Educational Material (MEIs)

OP4-10

ANALYSIS OF EDUCATIONAL ACTIONS ASSOCIATED WITH PARTICIPATORY TEACHER TRAINING IN A SCHISTOSOMIASIS PREVENTION AND CONTROL PROGRAMME IN THE ENDEMIC MUNICIPALITY OF MALACACHETA, MINAS GERAIS

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Introduction: Schistosomiasis mansoni is endemic in Brazil. The highest prevalences and parasite loads are among school-age children. Studies to evaluate the limitations and potential of educational approaches to its control suggest that programmes should invest in strategies that address the local situation and the empowerment and integration of health and education personnel and provide for actions with the most vulnerable groups, such as schoolchildren.

Objectives: This study aims: (a) to assess *Schistosomiasis mansoni* infection rates among education personnel in Malacacheta, a municipality in the endemic area of Minas Gerais; (b) to train teachers as multipliers of knowledge of schistosomiasis among schoolchildren; (c) to evaluate the use, with primary and middle-school teachers, of two educational approaches on schistosomiasis prevention and control; and (d) to ascertain whether the educational approaches contributed to knowledge rearrangement that approximates the popular and scientific know-how of teachers and their pupils and whether that knowledge is sustainable over the course of a year.

Methodology: *S. mansoni* infection among education personnel in the municipality was estimated by parasitology stool test (n=522), using the Kato-Katz method. Two refresher courses using different, but complementary, educational approaches (critical pedagogy and pedagogy of creative play) to the disease were given to teachers of various different subjects. Semi-structured questionnaires were applied to teachers and their pupils, before and after the educational actions, in order to survey prior and acquired knowledge.

Preliminary Results: Preliminary analysis of the data showed that the prevalence of schistosomiasis in the study group was 5.9%, while the results of analysis of the questionnaires/interviews pointed to significant changes in knowledge of the disease among teachers who took the course and their pupils.

Conclusion: It is expected that, in the medium and long term, this knowledge acquisition will lead to changes in risk behaviour and reduced prevalence of infection.

Financial support: PAPES VI (Fiocruz/CNPq), PROEP (LECEG/IOC), FAPERJ

OP4-11

PRESENCE OF *Biomphalaria* GENER AND HOLDERS OF *Schistosoma mansoni* IN URBAN AREAS OF FEIRA DE SANTANA, BA

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INTRODUCTION. *Schistosoma mansoni* is a parasite that can cause serious health problems and even death of the individual (NEVES, 2005). Human infection by this parasite remains an important prevalent endemic disease in the world (CARLI, 2011). This study aimed to perform parasitological study associated with socioeconomic and environmental profile of the population in three microareas of the Mangabeira neighborhood, Feira de Santana, BA. **METHODOLOGY**. For characterization of population and local of study, after Informed Consent signing by family head was applied the form about socioeconomic and environmental conditions. All snails found in ponds and streams near the studied homes were captured. Twelve snails identified as *Biomphalaria glabrata* was analyzed for *Schistosoma* presence. Research of *S. mansoni* in the people was carried out by the methods of spontaneous sedimentation and Kato-katz. Sixty-five families agreed to participate of the study. Two hundred and four stool samples were examined. To evaluate the association between human positivity and the variables economic and environmental was applied the Pearson test ($\chi 2$), considering as significance any $p < 0.05$. **RESULTS**. The prevalence of *S. mansoni* eggs in the people was 2.5%. Infective forms of the parasite were found in all snails found in areas near the ponds. There was statistical significance between two independent variables, economic activity of the household head and the lack of bathrooms in the house, and positive for *S. mansoni*. **CONCLUSION**. According to the results, environmental and socioeconomic factors influence the appearance and maintenance of parasitic diseases,

Source of Financial Support: State University of Feira de Santana

among them, schistosomiasis. Especially because there are, in microareas studied, open sewers, ponds and streams with presence of infected intermediate host.

Source of Financial Support: State University of Feira de Santana