Effect of Schistosomiasis (bilharzia) in Pregnancy


**Author(s):** Anchang-Kimbi J.K.; Elad D.M.; Sotoing G.T.; Achidi E.A.

**Source:** Journal of Parasitology Research; 2017; vol. 2017

**Publication Date:** 2017

**Publication Type(s):** Article

Available in full text at *Journal of Parasitology Research* - from National Library of Medicine

**Abstract:** Background. Malaria and urogenital schistosomiasis are coendemic in Mount Cameroon Area. This study investigated the prevalence of *S. haematobium*, *P. falciparum*, and coinfections and their effect on anaemia in pregnancy. Methods. Pregnant women reporting for antenatal care (ANC) clinic visit in Munyenge were enrolled. *S. haematobium* and *P. falciparum* infections were determined by urine filtration and microscopy, respectively. Haemoglobin (Hb) levels were measured using haemoglobinometer. Of 250 women, 46.8%, 39.2%, and 15.2% had *S. haematobium*, *P. falciparum*, and coinfections, respectively. Schistosomes infection was higher in younger women (25 years) and those who had only domestic contact with stream. Lower infection rate was associated with less water contact (2 times/day). Compared with no sulphadoxine-pyrimethamine (SP) usage, malaria parasitaemia was less among women who used SP. Stream usage increased risk of coinfection while less water contact and SP usage decreased its risk. All coinfected cases were anaemic and coinfection accounted for 93.8% of severe anaemia. Conclusion. Coinfection contributes to anaemia severity. Less water contact and SP usage will reduce coinfection in pregnancy in Munyenge. Copyright © 2017 Judith K. Anchang-Kimbi et al.

**Database:** EMBASE
The impact of prenatal exposure to parasitic infections and to anthelminthic treatment on antibody responses to routine immunisations given in infancy: Secondary analysis of a randomised controlled trial

Author(s): Nash S.; Elliott A.M.; Mentzer A.J.; Lule S.A.; Kizito D.; Smits G.; van der Klis F.R.M.

Source: PLoS Neglected Tropical Diseases; Feb 2017; vol. 11 (no. 2)

Publication Date: Feb 2017

Publication Type(s): Article

Available in full text at PLoS Neglected Tropical Diseases - from ProQuest

Available in full text at PLoS Neglected Tropical Diseases - from National Library of Medicine

Abstract: Background: Chronic parasitic infections are associated with active immunomodulation which may include by-stander effects on unrelated antigens. It has been suggested that pre-natal exposure to parasitic infections in the mother impacts immunological development in the fetus and hence the offspring's response to vaccines, and that control of parasitic infection among pregnant women will therefore be beneficial. Methodology/Principal findings: We used new data from the Entebbe Mother and Baby Study, a trial of anthelminthic treatment during pregnancy conducted in Uganda, to further investigate this hypothesis. 2705 mothers were investigated for parasitic infections and then randomised to albendazole (400mg) versus placebo and praziquantel (40mg/kg) during pregnancy in a factorial design. All mothers received sulfadoxine/pyrimethamine for presumptive treatment of malaria. Offspring received Expanded Programme on Immunisation vaccines at birth, six, 10 and 14 weeks. New data on antibody levels to diphtheria toxin, three pertussis antigens, Haemophilus influenzae type B (HiB) and Hepatitis B, measured at one year (April 2004 -May 2007) from 1379 infants were analysed for this report. Additional observational analyses relating maternal infections to infant vaccine responses were also conducted. Helminth infections were highly prevalent amongst mothers (hookworm 43.1%, Mansonella 20.9%, Schistosoma mansoni 17.3%, Strongyloides 11.7%, Trichuris 8.1%) and 9.4% had malaria at enrolment. In the trial analysis we found no overall effect of either anthelminthic intervention on the measured infant vaccine responses. In observational analyses, no species was associated with suppressed responses. Strongyloidiasis was associated with enhanced responses to pertussis toxin, HiB and Hep B vaccine antigens. Conclusions/Significance: Our results do not support the hypothesis that routine anthelminthic treatment during pregnancy has a benefit for the infant's vaccine response, or that maternal helminth infection has a net suppressive effect on the offspring's response to vaccines. Trial Registration: ISRCTN.com ISRCTN32849447

Database: EMBASE
Urogenital schistosomiasis during pregnancy is associated with low birth weight delivery: analysis of a prospective cohort of pregnant women and their offspring in Gabon.

Author(s): Mombo-Ngoma, Ghyslain; Honkpehedji, Josiane; Basra, Arti; Mackanga, Jean Rodolphe; Zoleko, Rella Manego; Zinsou, Jeannot; Agobe, Jean Claude Dejon; Lell, Bertrand; Matsiegui, Pierre-Blaise; Gonzales, Raquel; Agnandji, Selidji Todagbe; Yazdanbakhsh, Maria; Menendez, Clara; Kremsner, Peter G; Adegnika, Ayola Akim; Ramharter, Michael

Source: International journal for parasitology; Jan 2017; vol. 47 (no. 1); p. 69-74

Publication Date: Jan 2017

Publication Type(s): Journal Article

PubMedID: 28003151

Abstract: An estimated 40 million women of childbearing age suffer from schistosomiasis. Animal models indicate a deleterious effect of maternal schistosomiasis on pregnancy outcomes. To date there is a lack of epidemiological evidence evaluating schistosomiasis-related morbidity in pregnancy. This study was designed to describe the impact of urogenital schistosomiasis on pregnancy outcomes in a highly endemic region of central Africa. Pregnant women attending antenatal clinics in Fougamou and Lambaréné, Gabon, were consecutively screened for the presence of Schistosoma haematobium eggs in diurnal urine samples. Maternal and newborn characteristics assessed at delivery were compared between infected and uninfected mothers. The impact of maternal schistosomiasis on low birth weight and preterm delivery was assessed using logistic regression analysis. Urogenital schistosomiasis was diagnosed in 103 (9%) of 1115 pregnant women. Maternal age was inversely associated with the prevalence of urogenital schistosomiasis, with a higher burden amongst nulliparous women. Low birth weight was more common amongst infants of S. haematobium-infected mothers. This association was unaffected by controlling for demographic characteristics, gestational age and Plasmodium infection status (adjusted Odds Ratio 1.93; 95% confidence interval: 1.08-3.42). Other risk factors associated with low birth weight delivery were underweight mothers (adjusted Odds Ratio 2.34; 95% confidence interval: 1.12-4.92), peripheral or placental Plasmodium falciparum infection (adjusted Odds Ratio 2.04; 95% confidence interval: 1.18-3.53) and preterm birth (adjusted Odds Ratio 3.12; 95% confidence interval: 1.97-4.96). Preterm delivery was not associated with S. haematobium infection (adjusted Odds Ratio 1.07 95% confidence interval: 0.57-1.98). In conclusion, this study indicates that pregnant women with urogenital schistosomiasis are at an increased risk for low birth weight deliveries. Further studies evaluating targeted treatment and prevention programmes for urogenital schistosomiasis in pregnant women and their impact on delivery outcomes are warranted.

Database: Medline

Author(s): Blackwell, Aaron D

Source: International journal of women's health; 2016; vol. 8; p. 651-661

Publication Date: 2016

Publication Type(s): Journal Article Review

PubMedID: 27956844

Available in full text at International Journal of Women's Health - from Free Access Content

Available in full text at International Journal of Women's Health - from National Library of Medicine

Abstract: Helminths are parasitic nematodes and trematodes, grouped together because of morphological similarities and commonalities in the effects infections have on hosts. These include complications such as anemia and biasing of immune responses, which can alter susceptibility for other diseases. For pregnant women, these complications might have implications for pregnancy outcomes or neonatal health. Here, I review studies of helminth infections during pregnancy, and ask the following questions: Do helminths affect maternal health or pregnancy outcomes? Are there consequences of maternal infection for infants? What are the effects of antihelminth treatment during pregnancy? The evidence suggests that the answers to these questions depend on the particular helminth species in question, maternal nutritional status, and the presence or absence of comorbid infection with other species, such as malaria. Moreover, there may also be unexpected consequences of treatment, as maternal infections can affect the priming of infant immune systems, with potential effects on infants later in life. These complex interactions suggest that a consideration of the evolutionary history of human-helminth interactions, as well as the ecological context of infections, can help to clarify an understanding of these host-parasite interactions and provide direction for future investigations.

Database: Medline

5. Hematologic Changes Associated with Specific Infections in the Tropics.

Author(s): Roberts, David J

Source: Hematology/oncology clinics of North America; Apr 2016; vol. 30 (no. 2); p. 395-415

Publication Date: Apr 2016

Publication Type(s): Journal Article Review

PubMedID: 27040961

Abstract: Anemia frequently accompanies and plays a minor role in the presentation and course of infection, whether parasitic, bacterial, or viral. However, a variety of infections, many of which are common in Africa and Asia, cause specific hematologic syndromes. The pathophysiology of these syndromes is complex, and to some extent, reduced red cell production may form part of an innate protective host response to infection. Across the world and in endemic areas, malaria is the most important among this group of infections and forms a major part of everyday practice.

Database: Medline
6. Schistosomiasis transmission; socio-demographic, knowledge and practices as transmission risk factors in pregnant women

Author(s): Salawu O.T.; Odaibo A.B.

Source: Journal of Parasitic Diseases; Mar 2016; vol. 40 (no. 1); p. 93-99

Publication Date: Mar 2016

Publication Type(s): Article

Available in full text at Journal of Parasitic Diseases - from Springer Link Journals
Available in full text at Journal of Parasitic Diseases - from Free Access Content

Abstract: Schistosoma transmission is influenced by the interplay between various factors ranging from parasite to host associated factors. While many studies have focused on mass chemotherapy to reduce transmission in other populations, no study has examined the impact of social factors that favour transmission in pregnant women in Nigeria. The study was conducted to assess the impact of knowledge, attitudes and sociodemographic factors on schistosomiasis burden in pregnant women of rural communities of Nigeria. A cross sectional community-based field study was conducted to assess the association between Schistosomahaematobium burden and the associated risk factors among pregnant women in rural endemic communities of Nigeria. Structured questionnaire was used to gather information on participants' socio-demographic data, knowledge on schistosomiasis and water contact activities. Of the 237 respondents examined microscopically for infection, 50 (21.1 %) were infected with overall mean infection intensity of 69.6 +/- 165.2 eggs/10 mL urine. Multivariate logistic analysis showed occupation of the women to be associated with infection with the artisans having the highest risk (OR 3.34, CI 1.67-6.69, P = 0.022). Contact with water and water usage patterns are also associated with prevalence of disease with fetching (OR 2.04, CI 0.19-3.51, P = 0.003) and multipurpose water usage (OR 4.31, CI 2.17-8.57, P = 0.0002) being the most predisposing variables respectively. Awareness about water borne diseases showed no association with infection (P = 0.382) with typhoid (23.7 %) and fever (2.6 %) constituting the most and least common water borne diseases mentioned by the women. Health education and provision of good water supply should be integrated into the control strategies in order reduce transmission in endemic areas. Copyright © 2014, Indian Society for Parasitology.

Database: EMBASE

**Author(s):** Olveda, Remigio M; Acosta, Luz P; Tallo, Veronica; Baltazar, Palmera I; Lesiguez, Jenny Lind S; Estanislao, Georgette G; Ayaso, Edna B; Monterde, Donna Bella S; Ida, Antonio; Watson, Nora; McDonald, Emily A; Wu, Hannah W; Kurtis, Jonathan D; Friedman, Jennifer F

**Source:** The Lancet. Infectious diseases; Feb 2016; vol. 16 (no. 2); p. 199-208

**Publication Date:** Feb 2016

**Publication Type(s):** Research Support, N.i.h., Extramural Randomized Controlled Trial Clinical Trial, Phase II Journal Article

**PubMedID:** 26511959

Available in full text at Lancet Infectious Diseases, The - from ProQuest

**Abstract:** BACKGROUND Despite WHO recommendations to offer pregnant women treatment with praziquantel, many nations continue to withhold treatment, awaiting data from controlled trials addressing safety and efficacy. The objectives of this study were to assess whether treatment of pregnant women with schistosomiasis at 12-16 weeks gestation leads to improved maternal and newborn outcomes and to collect maternal and newborn safety data. METHODS This phase 2, randomised, double-blind, placebo-controlled trial was done in 72 barangays (villages) serviced by six municipal health centres in a schistosomiasis endemic region of northeastern Leyte, Philippines. Pregnant women (at 12-16 weeks gestation) who were otherwise healthy but infected with Schistosoma japonicum were enrolled and randomly assigned (1:1) to receive either over-encapsulated praziquantel (total dose 60 mg/kg given as two split doses) or placebo. Participants, investigators, midwives, and laboratory staff were all masked to treatment. The primary outcome was birthweight. Safety data were collected including immediate reactogenicity, post-dosing toxicology ascertained 24 h after study drug administration, and maternal and newborn serious adverse events. Analysis followed the intention-to-treat principle. Analyses were done using hierarchical generalised linear models to adjust for identified confounders and account for potential clustering of observations within villages and municipalities. This trial is registered with ClinicalTrials.gov, number NCT00486863. FINDINGS Between Aug 13, 2007, and Dec 3, 2012, 370 pregnant women were enrolled and randomly assigned to each treatment group (184 to the placebo group, 186 to the praziquantel group). Most women had low-intensity infections (n=334, 90%). Treatment with praziquantel did not have a significant effect on birthweight (2.85 kg in both groups, $\beta$=0.002 [95% CI -0.088 to 0.083]; p=0.962). Treatment was well tolerated with reactogenicity rates similar to those seen in non-pregnant participants (severe reactions occurred in five patients in the praziquantel group and two in the placebo group, and included headache, fever, and malaise). There were no significant differences in key safety outcomes including abortion, fetal death in utero, and congenital anomalies. INTERPRETATION Results from this study provide important data from a controlled trial in support of the expansion of treatment policies to include pregnant women as recommended by WHO. FUNDING National Institutes of Health, National Institute of Allergy and Infectious Diseases (U01AI066050).

**Database:** Medline
8. Gestation and breastfeeding in schistosomotic mothers differently modulate the immune response of adult offspring to postnatal Schistosoma mansoni infection

**Author(s):** Santos Pd.; Fernandes EdeS.; Sales I.R.; Nascimento W.R.; Albuquerque M.C.; Costa V.M.; Souza V.M.; Lorena V.M.; Gomes Yd.eM.

**Source:** Memorias do Instituto Oswaldo Cruz; Feb 2016; vol. 111 (no. 2); p. 83-92

**Publication Date:** Feb 2016

**Publication Type(s):** Article

**PubMedID:** 26872339

**Abstract:** Schistosoma mansoni antigens in the early life alter homologous and heterologous immunity during postnatal infections. We evaluate the immunity to parasite antigens and ovalbumin (OA) in adult mice born/suckled by schistosomotic mothers. Newborns were divided into: born (BIM), suckled (SIM) or born/suckled (BSIM) in schistosomotic mothers, and animals from noninfected mothers (control). When adults, the mice were infected and compared the hepatic granuloma size and cellularity. Some animals were OA + adjuvant immunised. We evaluated hypersensitivity reactions (HR), antibodies levels (IgG1/IgG2a) anti-soluble egg antigen and anti-soluble worm antigen preparation, and anti-OA, cytokine production, and CD4+FoxP3+T-cells by splenocytes. Compared to control group, BIM mice showed a greater quantity of granulomas and collagen deposition, whereas SIM and BSIM presented smaller granulomas. BSIM group exhibited the lowest levels of anti-parasite antibodies. For anti-OA immunity, immediate HR was suppressed in all groups, with greater intensity in SIM mice accompanied of the remarkable level of basal CD4+FoxP3+T-cells. BIM and SIM groups produced less interleukin (IL)-4 and interferon (IFN)-g. In BSIM, there was higher production of IL-10 and IFN-g, but lower levels of IL-4 and CD4+FoxP3+T-cells. Thus, pregnancy in schistosomotic mothers intensified hepatic fibrosis, whereas breastfeeding diminished granulomas in descendants. Separately, pregnancy and breastfeeding could suppress heterologous immunity; however, when combined, the responses could be partially restored in infected descendants.

**Database:** EMBASE


**Author(s):** Ben-Chetrit, Eli; Lachish, Tamar; Mørch, Kristine; Atlas, Drorit; Maguire, Conor; Schwartz, Eli

**Source:** Journal of travel medicine; 2015; vol. 22 (no. 2); p. 94-98

**Publication Date:** 2015

**Publication Type(s):** Journal Article

**PubMedID:** 25306906

**Available in full text at** Journal of Travel Medicine - from Oxford University Press ; Collection notes: To access please select Login with Athens and search and select NHS England as your institution before entering your NHS OpenAthens account details.

**Available in full text at** Journal of Travel Medicine - from John Wiley and Sons

**Available in full text at** Journal of Travel Medicine - from Wiley-Blackwell Free Backfiles NHS

**Abstract:** BACKGROUND Travel-related acquisition of schistosomiasis in Africa is well established. Data concerning Schistosoma infection in pregnant travelers are lacking and treatment derives from studies in endemic regions. METHODS This study was a retrospective case-series of pregnant patients who were infected with Schistosoma species. Data regarding exposure history, clinical presentation, diagnosis, treatment, and fetal outcomes were collected and analyzed. Diagnosis of schistosomiasis was based on serology tests and/or ova recovery. RESULTS Travel-related schistosomiasis during
pregnancy was diagnosed in 10 travelers (with 20 pregnancies). Of the 10 women, 4 pregnant travelers with recent exposure were treated during their pregnancy with praziquantel (PZQ). The course and outcome of pregnancy in these patients was uneventful, and treatment had no apparent adverse effects on either the mothers or their babies. Six asymptomatic women were diagnosed years after exposure. During this period, they gave birth to 13 babies. They were never treated with PZQ. Birth weights of their infants were significantly smaller as compared with those of the infants of the women who were treated during their pregnancy (median 2.8 vs 3.5 kg). One baby was born preterm. One patient had three miscarriages.

CONCLUSION This is the first case-series of pregnant travelers with schistosomiasis. Although a small case-series with possible confounders, it suggests that schistosomiasis in pregnant travelers can be treated. A trend of lower birth weights was observed in the infants of the pregnant travelers who were not treated. PZQ therapy during pregnancy was not associated with adverse pregnancy or fetal outcomes in those four cases. Our results emphasize the importance of screening female travelers of childbearing age with a relevant history of freshwater exposure. Further studies are needed to reinforce these recommendations.

Database: Medline


Author(s): Straubinger, Kathrin; Prazeres da Costa, Clarissa
Source: Advances in experimental medicine and biology; 2014; vol. 828 ; p. 27-48
Publication Date: 2014
Publication Type(s): Journal Article Review
PubMedID: 25253026
Database: Medline

11. A double load to carry: Parasites and pregnancy

Author(s): Tsoka-Gwegweni J.; Ntombela N.
Source: Southern African Journal of Epidemiology and Infection; 2014; vol. 29 (no. 2); p. 52-55
Publication Date: 2014
Publication Type(s): Article
Available in full text at Southern African Journal of Epidemiology and Infection - from Free Access Content

Abstract: Pregnancy drains the body physically, physiologically and immunologically. This burden is aggravated when combined with parasite infection. Intestinal parasitic infections in pregnancy have been associated with serious adverse outcomes, both for the mother and the unborn baby. In this article, we describe the prevalence and effects of these infections on pregnancy in women in Africa. There is a dearth of research on parasitic infections in pregnancy in South Africa. Most studies have focused on parasites in schoolchildren. This information gap needs urgent attention in a country with the added burden of human immunodeficiency virus (HIV) during pregnancy, as well as unacceptable levels of maternal mortality; and especially so in the light of growing evidence of a link between HIV and parasitic infections.
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Database: EMBASE
12. The impact of praziquantel given at 12-16 weeks gestation on pregnancy outcomes: Results of a double blind, placebo controlled trial

Author(s): Friedman J.F.; McDonald E.A.; Wu H.; Pond-Tor S.; Kurtis J.D.; Acosta L.P.; Baltazar P.; Tallo V.; Olveda R.M.; Watson N.L.

Source: American Journal of Tropical Medicine and Hygiene; Nov 2014; vol. 91 (no. 5); p. 17-18

Publication Date: Nov 2014

Publication Type(s): Conference Abstract

Available in full text at American Journal of Tropical Medicine and Hygiene, The - from National Library of Medicine

Available in full text at American Journal of Tropical Medicine and Hygiene, The - from Highwire Press

Abstract: Praziquantel was released in 1979, but was never studied in pregnant or lactating women, necessitating its designation as an FDA Pregnancy Class B drug. Given this, and the lack of well-controlled trials evaluating its safety and efficacy in this population, pregnant and lactating women are excluded from treatment programs in many countries where schistosomiasis is endemic. In 2002, based on post-market experience and a concern that Praziquantel would never be formally evaluated in human pregnancy, a WHO informal conference concluded that all schistosomiasis infected pregnant and lactating women should be considered a high-risk group and be offered treatment. Though many nations, particularly in sub-Saharan Africa, adopted this approach, many continue to withhold treatment pending more data on safety and efficacy. The objectives of this randomized, double blind placebo controlled trial were to evaluate the safety and efficacy of Praziquantel given to pregnant women infected with S. japonicum at 12-16 weeks gestation. Women were enrolled into the study if they provided informed consent and were over age 18, infected with S. japonicum, otherwise healthy, and pregnant at 12-16 weeks gestation. Women (N=380) were enrolled and treated with overencapsulated Praziquantel (60 mg/kg in split dose) or placebo and admitted for 24 hours. The following efficacy outcomes were ascertained: birthweight (primary), maternal hemoglobin and iron status at 32 weeks gestation, maternal gestational weight gain, newborn hemoglobin and birth weight. In addition, safety data were collected including toxicology pre and post dosing, abortion and miscarriage rates, and congenital anomalies. Though all analyses for these efficacy and safety outcomes are complete and data locked, we cannot report these until pharmacokinetic studies are completed (expected summer of 2014). We will present the impact of treatment on the aforementioned outcomes. Results from this trial will provide important data from a well controlled study to inform policies regarding treatment of this high risk group.

Database: EMBASE
13. Helminth infections during pregnancy is associated with impaired vaccine efficacy in Kenyan infants

Author(s): Malhotra I.; Mungai P.L.; McKibben M.J.; Sutherland L.J.; Wang X.; King C.H.; King C.L.; Muchiri E.; LaBeaud A.D.

Source: American Journal of Tropical Medicine and Hygiene; Nov 2014; vol. 91 (no. 5); p. 10

Publication Date: Nov 2014

Publication Type(s): Conference Abstract

Available in full text at American Journal of Tropical Medicine and Hygiene, The - from National Library of Medicine

Available in full text at American Journal of Tropical Medicine and Hygiene, The - from Highwire

Abstract: Both animal models and human studies suggest that parasitic infections can result in decreased vaccine efficacy. Maternal parasitic infections during pregnancy prime the fetal immune response and induce an immunomodulatory phenotype at birth that may affect subsequent immune responses to childhood vaccines. We investigated whether prenatal exposure to helminth infections affect the pattern of infant immune response to standard vaccination against Haemophilus influenzae (Hib), hepatitis B (Hep B), tetanus toxoid (TT) and diphtheria toxoid (DT). 450 Kenyan women were tested for LF, urogenital schistosomiasis, malaria, and intestinal helminths during pregnancy. Their newborns were followed biannually to age 36 months and tested for levels of IgG against Hib, Hep B, TT, and DT at each time point. Overall, one third of the mothers were infected with LF, urogenital schistosomiasis, malaria or hookworm. Using a generalized estimating equation analysis, the presence of multiple maternal infections were associated with lower immune response to Hib PRP-specific IgG (p=0.001, 0.002, 0.045 with one infection; p=0.028, 0.022, 0.051 with two infections at 12, 18 and 24 months of age), compared to no maternal infection. There was a significant difference in response to DT in infants of mothers with three or more infections (p=0.001 and 0.02 at 6 and 12 months) compared to no maternal infection. Response to Hib was also associated with immunophenotype; offspring putatively tolerated to filarial antigens (LF infected mothers but lacking filarial-specific Th1/Th2-type response in cord blood, N=94) compared to unexposed (no evidence of maternal LF infection nor antigen responsiveness in cord blood, N=119) had a lowest vaccine-induced antibody response to Hib-specific IgG (p=0.052, 0.033 and 0.035 at 12, 18 and 24 months). Antenatal helminth infections are associated with lower immune response to Hib and DT vaccine antigens. Thus, in developing countries, eradication of chronic helminthic infections may be imperative to the success of future global vaccination efforts.

Database: EMBASE
14. Helminth infections during pregnancy may decrease nutritional fitness of the offspring

Author(s): McDonald E.A.; Pond-Tor S.; Kurtis J.D.; Friedman J.F.; Jarilla B.; Sagliba M.J.; Gonzal A.; Olveda R.; Acosta L.

Source: American Journal of Tropical Medicine and Hygiene; Nov 2014; vol. 91 (no. 5); p. 527

Publication Date: Nov 2014

Publication Type(s): Conference Abstract

Available in full text at American Journal of Tropical Medicine and Hygiene, The - from National Library of Medicine
Available in full text at American Journal of Tropical Medicine and Hygiene, The - from Highwire Press

Abstract: Helminth infections represent a significant disease burden in endemic regions of the world, and polyparasitism may have a bigger impact on overall health than any individual infection. We have previously shown that Schistosoma japonicum results in a profound pro-inflammatory response at the maternal-fetal interface during pregnancy and decreased invasion characteristics of placental trophoblast cells in vitro. Another critical function of the placenta is to regulate nutrient exchange between mother and fetus. Herein, we have shown that treatment in vitro of primary trophoblasts with schistosome soluble egg antigens (SEA), resulted in a significant drop in gene expression of specific amino acid transporters. These include the sodium-coupled neutral amino acid transporter 1 (SNAT1; 80% reduction) and large neutral acid transporter (LAT1; 70% reduction). To investigate the metabolic impact of helminth infections during pregnancy, we utilized samples from a cohort of pregnant women from Leyte, the Philippines. Most subjects had polyparasitic infections, including schistosomiasis and geohelminth infections, with prevalence rates of 70%, 79%, and 40% for Ascaris lumbricoides, Trichuris trichiura, and hookworm, respectively. Given the relatively low intensity of schistosome infection and the high prevalence rates of geohelminths, we assessed the relationship between the number of helminth infections and metabolic parameters in utero. After controlling for SES and gestational age, leptin levels were found to be lower in the cord blood of infants born to mothers with one or more helminth infections. In addition, cord blood leptin levels were positively associated with birth weight (107g heavier on average in those infants in the highest tertile of leptin levels), and increased leptin levels were associated with a reduced risk of fetal growth restriction. These data suggest that helminth infections can impact the transport of nutrients across the maternal-fetal interface, providing a possible link between fetal metabolic hormones and growth in utero.

Database: EMBASE
15. **Maternal schistosomiasis: a growing concern in sub-Saharan Africa.**

**Author(s):** Salawu, Oyetunde T; Odaibo, Alexander B

**Source:** Pathogens and global health; Sep 2014; vol. 108 (no. 6); p. 263-270

**Publication Date:** Sep 2014

**Publication Type(s):** Journal Article Review

**PubMedID:** 25223633

Available in full text at Pathogens and Global Health - from National Library of Medicine

**Abstract:** Schistosomiasis remains one of the most important tropical parasitic infections threatening millions of lives in endemic areas. Cases of infections due to *Schistosoma* spp, the dicious digenetic trematodes have been on the increase over the last decades. While considerable efforts have been made to reduce infections and morbidities in most endemic areas, these efforts seem to be tailored only towards a specific group (school-based resources). This bias towards school children in epidemiological studies has also been observed in various research efforts in sub-Saharan Africa, thus making it difficult to produce a reliable estimate of the extent of infection in other strata of the population at risk. In recent times, attention has been drawn to *Schistosoma* spp infections in infants and preschool children, while studies on epidemiology of maternal schistosomiasis still suffer neglect. Considering the potential morbidity of *Schistosoma* infections on the mothers, fetuses, and neonates, as evidenced in some animal models and human case studies, more attention is solicited in all areas of observational studies and clinical trials, for maternal schistosomiasis with the aim of providing relevant data and information for effective management of the disease during pregnancy.

**Database:** Medline

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16. **Schistosomiasis japonica during pregnancy is associated with elevated endotoxin levels in maternal and placental compartments.**

**Author(s):** McDonald, Emily A; Pond-Tor, Sunthorn; Jarilla, Blanca; Sagliba, Marianne J; Gonzal, Annaliza; Amoyle, Amabelle J; Olveda, Remigio; Acosta, Luz; Gundogan, Fusun; Ganley-Leal, Lisa M; Kurtis, Jonathan D; Friedman, Jennifer F

**Source:** The Journal of infectious diseases; Feb 2014; vol. 209 (no. 3); p. 468-472

**Publication Date:** Feb 2014

**Publication Type(s):** Research Support, N.i.h., Extramural Journal Article

**PubMedID:** 23964108

Available in full text at Journal of Infectious Diseases - from Highwire Press

Available in full text at Journal of Infectious Diseases, The - from Oxford University Press ; Collection notes: To access please select Login with Athens and search and select NHS England as your institution before entering your NHS OpenAthens account details.

**Abstract:** Schistosomiasis affects approximately 40 million women of reproductive age and has been linked to elevated levels of circulating endotoxin in nonpregnant individuals. We have evaluated endotoxin levels in maternal, placental, and newborn blood collected from women residing in Leyte, Philippines. Endotoxin levels in both maternal and placental compartments in pregnant women with schistosomiasis were 1.3- and 2.4-fold higher, respectively, than in uninfected women. In addition, higher concentrations of endotoxin in placental blood were associated with premature birth, acute chorioamnionitis, and elevated proinflammatory cytokines. By promoting endotoxemia, schistosomiasis may exert additional, maladaptive influences on pregnancy outcomes.

**Database:** Medline
17. The Association of Parasitic Infections in Pregnancy and Maternal and Fetal Anemia: A Cohort Study in Coastal Kenya

Author(s): McClure E.M.; Meshnick S.R.; Siega-Riz A.M.; Mungai P.; Malhotra I.; King C.L.; Dent A.E.; Goldenberg R.L.; Hudgens M.G.

Source: PLoS Neglected Tropical Diseases; Feb 2014; vol. 8 (no. 2)

Publication Date: Feb 2014

Publication Type(s): Article

PubMedID: 24587473

Abstract: Background: Relative contribution of these infections on anemia in pregnancy is not certain. While measures to protect pregnant women against malaria have been scaling up, interventions against helminthes have received much less attention. In this study, we determine the relative impact of helminthes and malaria on maternal anemia.

Methods: A prospective observational study was conducted in coastal Kenya among a cohort of pregnant women who were recruited at their first antenatal care (ANC) visit and tested for malaria, hookworm, and other parasitic infections and anemia at enrollment. All women enrolled in the study received presumptive treatment with sulfadoxine-pyrimethamine, iron and multi-vitamins and women diagnosed with helminthic infections were treated with albendazole. Women delivering a live, term birth, were also tested for maternal anemia, fetal anemia and presence of infection at delivery.

Principal Findings: Of the 706 women studied, at the first ANC visit, 27% had moderate/severe anemia and 71% of women were anemic overall. The infections with highest prevalence were hookworm (24%), urogenital schistosomiasis (17%), trichuria (10%), and malaria (9%). In adjusted and unadjusted analyses, moderate/severe anemia at first ANC visit was associated with the higher intensities of hookworm and P. falciparum microscopy-malaria infections. At delivery, 34% of women had moderate/severe anemia and 18% of infants' cord hemoglobin was consistent with fetal anemia. While none of the maternal infections were significantly associated with fetal anemia, moderate/severe maternal anemia was associated with fetal anemia.

Conclusions: More than one quarter of women receiving standard ANC with IPTp for malaria had moderate/severe anemia in pregnancy and high rates of parasitic infection. Thus, addressing the role of co-infections, such as hookworm, as well as under-nutrition, and their contribution to anemia is needed. © 2014 McClure et al.

Database: EMBASE
18. Maternal infection with Schistosoma japonicum induces a profibrotic response in neonates.

**Author(s):** McDonald, Emily A; Cheng, Ling; Jarilla, Blanca; Sagliba, Marianne J; Gonzal, Annaliza; Amoylen, Amabelle J; Olveda, Remigio; Acosta, Luz; Baylink, David; White, Eric S; Friedman, Jennifer F; Kurtis, Jonathan D

**Source:** Infection and immunity; Jan 2014; vol. 82 (no. 1); p. 350-355

**Publication Date:** Jan 2014

**Publication Type(s):** Research Support, N.i.h., Extramural Journal Article

**PubMedID:** 24166958

Available in full text at Infection and Immunity - from National Library of Medicine

**Abstract:** The global burden of schistosomiasis is significant, with fibrosis a major associated morbidity and the primary cause of mortality. We have previously shown that schistosomiasis during pregnancy upregulates proinflammatory cytokines in the cord blood. In this study, we extend these findings to include a large panel of fibrosis-associated markers. We developed a multiplex bead-based assay to measure the levels of 35 proteins associated with fibrosis. Cord blood from 109 neonates born to mothers residing in an area of Schistosoma japonicum endemicity was assessed for these molecules. Ten mediators were elevated in the cord blood from schistosome-infected pregnancies, including insulin-like growth factor 1 (IGF-1), tumor growth factor β1 (TGF-β1), connective tissue growth factor (CTGF), procollagen I carboxy-terminal propeptide (PICP), amino-telopeptide of type 1 collagen (ICTP), collagen VI, desmosine, matrix metalloproteinase 2 (MMP-2), tissue inhibitor of metalloproteinases 1 (TIMP-1), and TIMP-4. Many of these were also positively correlated with preterm birth (PICP, ICTP, MMP-2, TGF-β1, desmosine, CTGF, TIMP-1). In addition, birth weight was 168 g lower for infants with detectable levels of CTGF than for those with CTGF levels below the level of detection. Maternal schistosomiasis results in upregulation of fibrosis-associated proteins in the cord blood of the neonate, a subset of which are also associated with adverse birth outcomes. As the first report of fibrosis-associated molecules altered in the newborn of infected mothers, this study has broad implications for the health of the fetus, stretching from gestation to adulthood.

**Database:** Medline

Author(s): Hotez, Peter; Whitham, Megan

Source: Obstetrics and gynecology; Jan 2014; vol. 123 (no. 1); p. 155-160

Publication Date: Jan 2014

Publication Type(s): Journal Article

PubMedID: 24463676

Available in print at Patricia Bowen Library and Knowledge Service West Middlesex university Hospital - from Obstetrics and Gynecology

Available in full text at Obstetrics and Gynecology - from Ovid

Abstract: Emerging evidence over the past decade has implicated helminth infections as important yet stealth causes of adverse pregnancy outcomes and impaired women's reproductive health. The two most important helminth infections affecting women living in poverty in Africa and elsewhere in the developing world are hookworm infection and schistosomiasis. In Africa alone, almost 40 million women of childbearing age are infected with hookworms, including almost 7 million pregnant women who are at greater risk of severe anemia, higher mortality, and experiencing poor neonatal outcome (reduced birth weight and increased infant mortality). Possibly, tens of millions of women in Africa also suffer from female genital schistosomiasis associated with genital itching and pain, stress incontinence, dyspareunia, and infertility and experience social stigma and depression. Female genital schistosomiasis also is linked to horizontal transmission of human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) and it may represent one of Africa's major cofactors in its AIDS epidemic. There is urgency to expand mass drug administration efforts for hookworm and schistosomiasis to include women of reproductive age and to shape new policies and advocacy initiatives for women's global health to include helminth control. In parallel is a requirement to better link global health programs for HIV and AIDS and malaria with helminth control and to simultaneously launch initiatives for research and development.

Database: Medline

20. Effect of maternal Schistosoma mansoni infection and praziquantel treatment during pregnancy on Schistosoma mansoni infection and immune responsiveness among offspring at age five years.

Author(s): Tweyongyere, Robert; Naniima, Peter; Mawa, Patrice A; Jones, Frances M; Webb, Emily L; Cose, Stephen; Dunne, David W; Elliott, Alison M

Source: PLoS neglected tropical diseases; 2013; vol. 7 (no. 10); p. e2501

Publication Date: 2013

Publication Type(s): Research Support, Non-u.s. Gov't Randomized Controlled Trial Journal Article

PubMedID: 24147175

Available in full text at PLoS Neglected Tropical Diseases - from ProQuest

Available in full text at PLoS Neglected Tropical Diseases - from National Library of Medicine

Abstract: INTRODUCTION Offspring of Schistosoma mansoni-infected women in schistosomiasis-endemic areas may be sensitised in-utero. This may influence their immune responsiveness to schistosome infection and schistosomiasis-associated morbidity. Effects of praziquantel treatment of S. mansoni during pregnancy on risk of S. mansoni infection among offspring, and on their immune responsiveness when they become exposed to S. mansoni, are unknown. Here we examined effects of praziquantel treatment of S. mansoni during pregnancy on prevalence of S. mansoni and immune responsiveness among offspring at age five years.

METHODS In a trial in Uganda (ISRCTN32849447,
http://www.controlled-trials.com/ISRCTN32849447/elliott), offspring of women treated with praziquantel or placebo during pregnancy were examined for S. mansoni infection and for cytokine and antibody responses to SWA and SEA, as well as for T cell expression of FoxP3, at age five years. RESULTS Of the 1343 children examined, 32 (2.4%) had S. mansoni infection at age five years based on a single stool sample. Infection prevalence did not differ between children of treated or untreated mothers. Cytokine (IFNγ, IL-5, IL-10 and IL-13) and antibody (IgG1, Ig4 and IgE) responses to SWA and SEA, and FoxP3 expression, were higher among infected than uninfected children. Praziquantel treatment of S. mansoni during pregnancy had no effect on immune responses, with the exception of IL-10 responses to SWA, which was higher in offspring of women that received praziquantel during pregnancy than those who did not. CONCLUSION We found no evidence that maternal S. mansoni infection or its treatment during pregnancy influence prevalence and intensity of S. mansoni infection or effector immune response to S. mansoni infection among offspring at age five years, but the observed effects on IL-10 responses to SWA suggest that maternal S. mansoni and its treatment during pregnancy may affect immunoregulatory responsiveness in childhood schistosomiasis. This might have implications for pathogenesis of the disease.

Database: Medline


Author(s): Barrion, Maria; Voss, Joachim G

Source: The Nurse practitioner; Nov 2013; vol. 38 (no. 11); p. 33-40

Publication Date: Nov 2013

Publication Type(s): Journal Article

PubMedID: 24141548

Available in full text at Nurse Practitioner - from Ovid

Abstract: Schistosomiasis is a parasitic infection that causes significant morbidity and mortality, especially in pregnant women originating from developing countries. Prompt diagnosis and treatment can improve pregnancy and infant outcomes. Currently, there are no formal guidelines for treatment in this population, which makes schistosomiasis in pregnancy a challenge to treat.

Database: Medline
22. Treatment with anthelminthics during pregnancy: What gains and what risks for the mother and child?

**Author(s):** Elliott A.M.; Ndibazza J.; Mpairwe H.; Muhangi L.; Kizito D.; Mawa P.; Webb E.L.; Tweyongyere R.; Muwanga M.

**Source:** Parasitology; Oct 2011; vol. 138 (no. 12); p. 1499-1507

**Publication Date:** Oct 2011

**Publication Type(s):** Review

**PubMedID:** 21810307

Available in full text at Parasitology - from ProQuest

**Abstract:** In 1994 and 2002, respectively, the World Health Organisation proposed that treatment for hookworm and schistosomiasis could be provided during pregnancy. It was hoped that this might have benefits for maternal anaemia, fetal growth and perinatal mortality; a beneficial effect on the infant response to immunisation was also hypothesised. Three trials have now been conducted. Two have examined the effects of benzimidazoles; one (the Entebbe Mother and Baby Study) the effects of albendazole and praziquantel. All three were conducted in settings of high prevalence but low intensity helminth infection. Results suggest that, in such settings and given adequate provision of haematinics, the benefit of routine anthelminthics during pregnancy for maternal anaemia may be small; none of the other expected benefits has yet been demonstrated. The Entebbe Mother and Baby Study found a significant adverse effect of albendazole on the incidence of infantile eczema in the whole study population, and of praziquantel on the incidence of eczema among infants of mothers with Schistosoma mansoni. Further studies are required in settings that differ in helminth species and infection intensities. Further research is required to determine whether increased rates of infantile eczema translate to long-term susceptibility to allergy, and to explore the underlying mechanisms of these effects. The risks and benefits of routine anthelminthic treatment in antenatal clinics may need to be reconsidered. Copyright © 2011 Cambridge University Press.

**Database:** EMBASE

23. Effect of praziquantel treatment of Schistosoma mansoni during pregnancy on immune responses to schistosome antigens among the offspring: results of a randomised, placebo-controlled trial.

**Author(s):** Tweyongyere, Robert; Mawa, Patrice A; Kihembo, Macklyn; Jones, Frances M; Webb, Emily L; Cose, Stephen; Dunne, David W; Vennervald, Birgitte J; Elliott, Alison M

**Source:** BMC infectious diseases; Sep 2011; vol. 11 ; p. 234

**Publication Date:** Sep 2011

**Publication Type(s):** Research Support, Non-u.s. Gov't Randomized Controlled Trial Journal Article

**PubMedID:** 21888656

Available in full text at BMC Infectious Diseases - from National Library of Medicine

Available in full text at BMC Infectious Diseases - from BioMed Central

Available in full text at BMC Infectious Diseases - from ProQuest

**Abstract:** BACKGROUND Offspring of women with schistosomiasis may exhibit immune responsiveness to schistosomes due to in utero sensitisation or trans-placental transfer of antibodies. Praziquantel treatment during pregnancy boosts maternal immune responses to schistosome antigens and reduces worm burden. Effects of praziquantel treatment during pregnancy on responses among offspring are unknown. METHODS In a trial of anthelminthic treatment during pregnancy in Uganda (ISRCTN32849447; http://www.controlled-trials.com/ISRCTN32849447/elliott),
offspring of women with Schistosoma mansoni were examined for cytokine and antibody responses to schistosome worm (SWA) and egg (SEA) antigen, in cord blood and at age one year. Relationships to maternal responses and pre-treatment infection intensities were examined, and responses were compared between the offspring of women who did, or did not receive praziquantel treatment during pregnancy.

RESULTS Of 388 S. mansoni-infected women studied, samples were obtained at age one year from 215 of their infants. Stool examination for S. mansoni eggs was negative for all infants. Cord and infant samples were characterised by very low cytokine production in response to schistosome antigens with the exception of cord IL-10 responses, which were substantial. Cord and infant cytokine responses showed no association with maternal responses. As expected, cord blood levels of immunoglobulin (Ig) G to SWA and SEA were high and correlated with maternal antibodies. However, by age one year IgG levels had waned and were hardly detectable. Praziquantel treatment during pregnancy showed no effect on cytokine responses or antibodies levels to SWA or SEA either in cord blood or at age one year, except for IgG1 to SWA, which was elevated in infants of treated mothers, reflecting maternal levels. There was some evidence that maternal infection intensity was positively associated with cord blood IL-5 and IL-13 responses to SWA, and IL-5 responses to SEA, and that this association was modified by treatment with praziquantel.

CONCLUSIONS Despite strong effects on maternal infection intensity and maternal immune responses, praziquantel treatment of infected women during pregnancy had no effect on anti-schistosome immune responses among offspring by age one year. Whether the treatment will impact upon the offspring’s responses on exposure to primary schistosome infection remains to be elucidated.

TRIAL REGISTRATION ISRCTN: ISRCTN32849447.

Database: Medline

24. Parasitic infections in pregnancy

Author(s): Dotters-Katz S.; Kuller J.; Heine R.P.

Source: Obstetrical and Gynecological Survey; Aug 2011; vol. 66 (no. 8); p. 515-525

Publication Date: Aug 2011

Publication Type(s): Article

PubMedID: 22018454

Available in full text at Obstetrical & gynecological survey. - from Ovid

Abstract: Parasitic infections affect tens of millions of pregnant women worldwide. These infections lead directly and indirectly to a spectrum of adverse maternal and fetal/placental effects. With the increase in global travel, healthcare providers will care for women who have recently moved from or traveled to areas where these infections are endemic. We reviewed the literature, assessing case reports, case series, and prospective and retrospective trials, to provide guidelines for management of common parasitic infections in pregnancy. Parasitic infections tend to preferentially affect 1 part of the maternal-fetal unit. Thus, we categorize parasitic infections into those that preferentially cause harm to the mother, preferentially affect the fetus, and preferentially affect the placenta.

Target Audience: Obstetricians and Gynecologists, Family Physicians, and Nurse Midwives.

Learning Objectives: After completing this CME activity, physicians should be better able to differentiate immune modulators associated with parasitic infection and their relationship to adverse pregnancy outcomes; assess the specific effects of certain parasitic infections on the gravid female, her placenta, and her fetus; and in addition, design a treatment regimen for pregnant women presenting with a parasitic infection. © 2011 by Lippincott Williams & Wilkins.

Database: EMBASE
25. Anthelminthic treatment during pregnancy is associated with increased risk of infantile eczema: Randomised-controlled trial results

**Author(s):** Mpairwe H.; Muhangi L.; Ndibazza J.; Akishule D.; Nampijja M.; Ngom-wegi S.; Elliott A.M.; Webb E.L.; Rodrigues L.C.; Tumusime J.; Muwanga M.; Jones F.M.; Fitzsimmons C.; Dunne D.W.

**Source:** Pediatric Allergy and Immunology; May 2011; vol. 22 (no. 3); p. 305-312

**Publication Date:** May 2011

**Publication Type(s):** Article

**PubMedID:** 21255083

Available in full text at [Pediatric Allergy and Immunology](http://www.johnwiley.com) - from John Wiley and Sons

**Abstract:** Background: Allergy is commoner in developed than in developing countries. Chronic worm infections show inverse associations with allergy, and prenatal exposures may be critical to allergy risk. Objective: To determine whether anthelminthic treatment during pregnancy increases the risk of allergy in infancy. Methods: A randomised, double-blind, placebo-controlled trial on treatment in pregnancy with albendazole versus placebo and praziquantel versus placebo was conducted in Uganda, with a 2x2 factorial design; 2507 women were enrolled; infants' allergy events were recorded prospectively. The main outcome was doctor-diagnosed infantile eczema. Results: Worms were detected in 68% of women before treatment. Doctor-diagnosed infantile eczema incidence was 10.4/100 infant years. Maternal albendazole treatment was associated with a significantly increased risk of eczema [Cox HR (95% CI), p: 1.82 (1.26-2.64), 0.002]; this effect was slightly stronger among infants whose mothers had no albendazole-susceptible worms than among infants whose mothers had such worms, although this difference was not statistically significant. Praziquantel showed no effect overall but was associated with increased risk among infants of mothers with *Schistosoma mansoni* [2.65 (1.16-6.08), interaction p=0.02]. In a sample of infants, skin prick test reactivity and allergen-specific IgE were both associated with doctor-diagnosed eczema, indicating atopic aetiology. Albendazole was also strongly associated with reported recurrent wheeze [1.58 (1.13-2.22), 0.008]; praziquantel showed no effect. Conclusions: The detrimental effects of treatment suggest that exposure to maternal worm infections in utero may protect against eczema and wheeze in infancy. The results for albendazole are also consistent with a direct drug effect. Further studies are required to investigate mechanisms of these effects, possible benefits of worms or worm products in primary prevention of allergy, and the possibility that routine deworming during pregnancy may promote allergic disease in the offspring. © 2011 John Wiley & Sons A/S.

**Database:** EMBASE
26. Maternal Schistosomiasis japonica is associated with maternal, placental, and fetal inflammation.

**Author(s):** Kurtis, Jonathan D; Higashi, Ashley; Wu, Hai-Wei; Gundogan, Fusun; McDonald, Emily A; Sharma, Surrendra; PondTor, Sunthorn; Jarilla, Blanca; Sagliba, Marriane Joy; Gonzal, Analisa; Olveda, Remigio; Acosta, Luz; Friedman, Jennifer F

**Source:** Infection and immunity; Mar 2011; vol. 79 (no. 3); p. 1254-1261

**Publication Date:** Mar 2011

**Publication Type(s):** Journal Article

**PubMedID:** 21149589

Available in full text at Infection and Immunity - from National Library of Medicine

Available in full text at Infection and Immunity - from Highwire Press

Available in full text at Infection and Immunity - from Free Access Content

**Abstract:** Schistosomes infect ~40 million women of childbearing age and result in the elaboration of proinflammatory cytokines that have been implicated in fetal growth restriction. In murine models and two observational studies in humans, schistosome infection during pregnancy was associated with reduced birth weight, although a recent treatment trial in Schistosoma mansoni did not detect this association. We conducted an observational study among 99 pregnant women living in an area of Schistosoma japonicum endemicity in the Philippines. We enrolled women at 32 weeks gestation and measured S. japonicum and geohelminth infection intensity. We collected maternal peripheral blood at 32 weeks gestation and placental and cord blood at delivery to assess inflammatory status. At delivery, we collected a placental-tissue sample and measured birth weight. In multivariate models adjusted for geohelminths, maternal schistosomiasis was associated with increased levels of inflammatory cytokines in maternal peripheral (tumor necrosis factor alpha [TNF-α] and interleukin 10 [IL-10]), placental (TNF-α, IL-6, TNF-α receptor II [RII], and IL-1β), and cord (IL-1β and TNF-α RII) blood, as well as acute subchorionitis and increased TNF-α production by syncytiotrophoblasts assessed by immunohistochemistry (all P < 0.05). After adjusting for confounders, placental IL-1β, and TNF-α production by syncytiotrophoblasts was independently associated with decreased birth weight (both P < 0.05). Our data indicate that maternal schistosomiasis results in a proinflammatory signature that is detectable in maternal, placental, and fetal compartments, and a subset of these responses are associated with decreased birth weight. This potential mechanistic link between maternal schistosomiasis and poor birth outcomes will contribute to the debate regarding treatment of maternal schistosome infections.

**Database:** Medline
27. Effects of treatment of helminths with albendazole and praziquantel in pregnancy on the incidence of allergy in the first year of life: Trial Results

**Author(s):** Mpairwe H.; Muhangi L.; Ndibazza J.; Elliott A.; Webb E.; Rodrigues L.; Tumusiime J.

**Source:** Allergy: European Journal of Allergy and Clinical Immunology; Jun 2009; vol. 64 ; p. 92

**Publication Date:** Jun 2009

**Publication Type(s):** Conference AbstractNHS

Available in full text at Allergy - from John Wiley and Sons

**Abstract:** Background: Allergy has been on the increase globally in the last five decades, with the highest prevalence in developed countries. In the developing countries, the prevalence is higher in urban than rural areas. Studies have found an inverse association between chronic helminth infection and allergy, proposed to be through their strong immuno-modulating effects which may even be passed on in utero. If helminths have a causal protective role in this association, de-worming may have a detrimental effect. Our objective was therefore to determine the effects of de-worming with albendazole and praziquantel in pregnancy on the incidence of allergy in infancy.

Methods: Entebbe Mother and Baby Study (EMaBS) in Uganda is a randomised, double-blind, placebo-controlled trial on treatment of helminths in pregnancy with albendazole versus placebo and praziquantel versus placebo in a 2 x 2 factorial design. Between 2003 and 2005, 2507 pregnant women were enrolled after providing a blood and stool sample for worm investigation. Following delivery all were de-wormed and their children followed up at the study clinic where all childhood illnesses and allergies were recorded and managed by qualified clinicians. Results: Analysis is by 'intention to treat'. For this analysis follow-up was censored at 1 year and eczema, as diagnosed by clinicians was the main outcome. A total of 228 eczema events occurred among 152 infants of the 2108 seen during infancy. Infants whose mothers received albendazole were at a significantly higher risk of eczema [Cox HR (95%CI), P: 1.82 (1.26-2.64), 0.002]. Praziquantel showed no effect overall [1.05 (0.73-1.50), 0.80], but when stratified according to maternal Schistosoma mansoni status, praziquantel was associated with a significantly increased risk of eczema among infants of infected mothers [2.65 (1.16-6.08), 0.02], whereas there was no effect among the infants of uninfected mothers [0.90 (0.60-1.35), 0.63]. Conclusion: This is the first intervention trial of de-worming during pregnancy to examine allergic disease events as an outcome. The observed detrimental effects of de-worming suggest that maternal helminth infections have a causal role in protection against eczema in infancy and that this effect is established in utero.

**Database:** EMBASE
Effect of praziquantel treatment of Schistosoma mansoni during pregnancy on intensity of infection and antibody responses to schistosome antigens: results of a randomised, placebo-controlled trial.

Author(s): Tweyongyere, Robert; Mawa, Patrice A; Emojong, Nicholas O; Mpairwe, Harriet; Jones, Frances M; Duong, Trinh; Dunne, David W; Vennervald, Birgitte J; Katunguka-Rwakishaya, Eli; Elliott, Alison M

Source: BMC infectious diseases; Mar 2009; vol. 9 ; p. 32

Publication Date: Mar 2009

Publication Type(s): Research Support, Non-u.s. Gov't Randomized Controlled Trial Journal Article

Abstract: BACKGROUND Praziquantel treatment of schistosomiasis during pregnancy was only recommended in 2002; hence the effects of treatment during pregnancy are not fully known. We have therefore evaluated the effects on infection intensity and the immunological effects of praziquantel treatment against Schistosoma mansoni during pregnancy, compared with treatment after delivery. METHODS A nested cohort of 387 Schistosoma mansoni infected women was recruited within a larger trial of de-worming during pregnancy. Women were randomised to receive praziquantel or placebo during pregnancy. All women were treated after delivery. Infection intensity after treatment was assessed by a single Kato-Katz examination of stool samples with duplicate slides and categorised as undetected, light (1-99 eggs per gram (epg)), moderate (100-399 epg) or heavy (>or=400 epg). Antibodies against S. mansoni worm and egg antigens were measured by ELISA. Results were compared between women first treated during pregnancy and women first treated after delivery. RESULTS At enrollment, 252 (65.1%) of the women had light infection (median (IQR) epg: 35 (11, 59)), 75 (19.3%) moderate (median (IQR) epg: 179(131, 227)) and 60 (15.5%) had heavy infection (median (IQR) epg: 749 (521, 1169)) with S. mansoni. At six weeks after praziquantel treatment during pregnancy S. mansoni infection was not detectable in 81.9% of the women and prevalence and intensity had decreased to 11.8% light, 4.7% moderate and 1.6% heavy a similar reduction when compared with those first treated after delivery (undetected (88.5%), light (10.6%), moderate (0.9%) and heavy (0%), p = 0.16). Parasite specific antibody levels were lower during pregnancy than after delivery. Praziquantel treatment during pregnancy boosted anti-worm IgG isotypes and to a lesser extent IgE, but these boosts were less pronounced than in women whose treatment was delayed until after delivery. Praziquantel had limited effects on antibodies against egg antigens. CONCLUSIONS mansoni antigen-specific antibody levels and praziquantel-induced boosts in antibody levels were broadly suppressed during pregnancy, but this was not associated with major reduction in the efficacy of praziquantel. Long-term implications of these findings in relation to resistance to re-infection remain to be explored.

Database: Medline
29. Protozoan and helminth infections in pregnancy. Short-term and long-term implications of transmission of infection from mother to foetus

**Author(s):** Petersen E.

**Source:** Parasitology; Dec 2007; vol. 134 (no. 13); p. 1855-1862

**Publication Date:** Dec 2007

**Publication Type(s):** Conference Paper

**PubMedID:** 17958920

Available in full text at Parasitology - from ProQuest

**Abstract:** This review of protozoan and helminth infections in pregnancy focuses on the impact on the immune response in the newborn infant to maternal infection. Studies of protozoan and helminth infections in pregnant women and in their offspring have shown that children exposed to antigens or microorganisms during pregnancy often have a reduced immune response to these infections. The most common finding is a reduced IFNgamma response to specific antigens regardless of specific infection studied. In some studies the impaired immune response disappeared before the age of one year, while in other studies the impaired immune response was present as much as two decades after birth. Data from chronic viral infections like Rubella, cytomegalovirus and hepatitis B also show that congenital or perinatal infections may result in a life-long inability to control the infections. Studies of both helminth and protozoan infections show that children exposed to antigens during gestation have a microorganism-specific impaired immune response which is characterized by reduced IFN-gamma and stimulation of responses to specific antigens. © 2007 Cambridge University Press.

**Database:** EMBASE

30. Schistosomiasis and pregnancy.

**Author(s):** Friedman, Jennifer F; Mital, Priya; Kanzaria, Hemal K; Olds, G Richard; Kurtis, Jonathan D

**Source:** Trends in parasitology; Apr 2007; vol. 23 (no. 4); p. 159-164

**Publication Date:** Apr 2007

**Publication Type(s):** Journal Article Review

**PubMedID:** 17336160

**Abstract:** Currently, schistosomes infect approximately 40 million women of child-bearing age, yet little is known about schistosome-associated morbidity in pregnant women and their offspring. Animal models indicate a deleterious effect of schistosome infection on maternal, fetal and neonatal outcomes. Case reports have documented maternal infection in association with poor birth outcomes, and two observational studies indicate that maternal schistosome infection might be associated with decreased birth weight. Rigorously identifying and quantifying the impact of schistosome infection on pregnancy outcomes with well-designed observational and treatment studies are crucial for improving birth outcomes in schistosome-endemic areas. In addition, studies that address the safety of praziquantel during pregnancy could lead to further adoption of the recent informal recommendation by the World Health Organization to treat schistosome-infected pregnant and lactating women.

**Database:** Medline
31. Schistosoma mansoni in pregnancy and associations with anaemia in northwest Tanzania.

**Author(s):** Ajanga, Antony; Lwambo, Nicholas J S; Blair, Lynsey; Nyandindi, Ursuline; Fenwick, Alan; Brooker, Simon

**Source:** Transactions of the Royal Society of Tropical Medicine and Hygiene; Jan 2006; vol. 100 (no. 1); p. 59-63

**Publication Date:** Jan 2006

**Publication Type(s):** Research Support, Non-u.s. Gov't Journal Article

**PubMedID:** 16219330

Available in full text at Transactions of The Royal Society of Tropical Medicine and Hygiene - from Oxford University Press ; Collection notes: To access please select Login with Athens and search and select NHS England as your institution before entering your NHS OpenAthens account details.

**Abstract:** Schistosomiasis among pregnant women has been inadequately investigated. In order to determine the importance of Schistosoma mansoni in this subgroup, we conducted a cross-sectional survey of 972 women in Tanzania and investigated the prevalence of Schistosoma mansoni, hookworm and malaria and their associations with anaemia. Overall, 63.5% of women were infected with S. mansoni, with prevalence highest among younger women and decreasing with increasing age. The prevalence of hookworm was 56.3%, and 16.4% of women had malaria parasitaemia. Overall, 66.4% of women were anaemic. Increased risk of anaemia was associated with heavy infection with S. mansoni but not hookworm or Plasmodium falciparum parasitaemia.

**Database:** Medline

32. Praziquantel for the treatment of schistosomiasis mansoni during pregnancy

**Author(s):** Adam I.; Elwasila E.; Homeida M.

**Source:** Annals of Tropical Medicine and Parasitology; Jan 2005; vol. 99 (no. 1); p. 37-40

**Publication Date:** Jan 2005

**Publication Type(s):** Article

**PubMedID:** 15701253

**Abstract:** In a prospective study carried out in New Halfa Teaching Hospital, in eastern Sudan, between June 2001 and April 2003, 25 pregnant Sudanese women with schistosomiasis mansoni were each treated with a single oral dose of praziquantel (PZQ), at 40 mg/kg. The drug was given to six (24%), 12 (48%) and seven (28%) of the women during the first, second and third trimesters of their pregnancies, respectively. The patients were followed-up until delivery and their babies were followed-up until they were 1 year old. Although one patient, who received PZQ after 10 weeks of gestation, aborted (3 weeks post-treatment), this frequency of abortion is similar to that seen in the local community. None of the treated women died, and there were no stillbirths or congenital abnormalities in the newborn babies. Although this is a small trial, it appears that PZQ is a safe drug to use against schistosomiasis mansoni, even during the first trimester of pregnancy.

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