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PS2.005

Prevalence and risk factors for *Strongyloides stercoralis* infection in Bolivia among patients at high risk of complications

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INTRODUCTION Strongyloidiasis can be fatal in immunocompromised patients. The prevalence of this neglected tropical disease has never been evaluated in Bolivia using sensitive tests. The aim of the study was to estimate the prevalence and risk factors for strongyloidiasis among patients at high risk of complications.

MATERIALS AND METHODS We conducted a multicenter study in Santa Cruz (400 m, tropical climate) and Cochabamba (high inter-Andean valleys, 2550 m, temperate climate) among patients with cancer, HIV, rheumatic or hematologic disease. Strongyloides IgG antibody titers were measured by enzyme-linked immunosorbent assay (Bordier Affinity Products) and two fresh stool samples were analyzed using four parasitological techniques (direct smear, Ritchie, Baermann and agar plate culture). A structured socio-demographic characteristics questionnaire was administered. Categorical variables were compared by chi-square test and $P < 0.05$ was considered statistically significant. Multivariable logistic regression model was used to evaluate adjusted OR for positive stool test.

RESULTS 1151 patients participated. The serological and coproparasitological prevalences were 23% (265/1151) and 7.6% (88/1151), respectively.

In both the unadjusted and adjusted analyses, factors associated with positive coproparasitology ($P < 0.05$) were younger age, living in rural area and low education level. There was no difference in prevalence between Cochabamba and Santa Cruz as defined by coproparasitology (6.4% vs. 8.9%; $P = 0.11$) or serology (24% vs. 22%; $P = 0.40$). Among 64 patients in Cochabamba who had never traveled to the tropical lowlands, 5 (7.8%) had a positive coproparasitology.

CONCLUSIONS The study demonstrates that strongyloidiasis is widely present in Bolivia and that many vulnerable patients are at risk of complications. Given the known performance of the serological test, the actual prevalence of strongyloïdiasis is estimated at 20%.

The transmission of this parasitosis is highest in tropical and subtropical areas, but also occurs at altitudes over 2500 m in regions with a temperate climate, as evidenced in Cochabamba. Bolivia should reinforce control strategies to prevent complications from this serious parasitic disease.

DISCLOSURE Nothing to disclose.

PS2.006

How to measure responses to anthelmintic treatments? Centile distribution of individual versus group mean egg reduction rates

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BACKGROUND Anthelmintics are given to millions of people under preventive chemotherapy programmes for schistosomiasis and soil-transmitted nematodes (STN). To assess treatment response, group means are used (egg reduction rate, ERR: the difference in mean egg counts in a group of treated individuals from before treatment to after treatment), aiming for ERR ≥90% for schistosomiasis and most STNs. However ERRs are not apt to describe the broad range of individual responses and identify suboptimal responses. We propose a different approach consisting in the distribution of individual ERR (iERR).

METHODS We compiled databases of 4375 subjects with *Schistosoma* spp infection (*S. mansoni* (*Sm*) = 1708, *S. japonicum* (*Sj*) = 300, *S. haematobium* (*Sh*) = 2367) treated with praziquantel (PZQ: 15 trials in Asia, Africa and Latin America); and 1832 school age children with *Ascaris* (AL) *Trichuris* (TT) and hookworms (HW) treated with 400 mg albendazole (ALB, $n = 613$) and 500 mg mebendazole (MBL, $n = 1219$) (5 trials in Africa, Asia and Central America).

We analysed the centile distribution of iERR and compared it to arithmetic mean ERR (ERRam). No change or increase in egg counts post-treatment count as no reduction (ERR = 0).

FINDINGS
Schistosoma. 6.3%, 1.7% and 4.3% of the subjects treated for *Sh*, *Sj* and *Sm*, respectively, had ERR = 0. The 5th, 10th, and 25th centiles of the subjects treated for *Sh* had iERRs of 0%, 49.3%, and 96.5%; values for Sj were 75%, 99%, and 99%; and for *Sm* 18.2%, 65.3%, and 99.8%. For comparison: ERRam was 86.6%, 96.7% and 86.7% for *Sh*, *Sj* and *Sm*.
STNs. Of the 613 subjects treated with ALB, 31.8%, 48.5% and 19.7% were infected with AL, TT and HW, respectively; corresponding values for MBL (n = 1219) were 43.6%, 42.1% and 14.3%.

5%, 36% and 8% of subjects treated with ABL for AL, TT and HW respectively had ERR = 0; figures with MBL for AL, TT and HW were 1%, 19% and 34%. The 5th, 10th, and 25th centiles of the subjects treated with ALB for AL had iERRs of 53.1%, 100% and 100%, respectively; for TT all 0%; and for HW: 0%, 44% and 89.3%. Corresponding values with MLB for AL were 96.4%, 100% and 100%; TT: 0%, 0% and 27.6%; HW: all 0%. For comparison, ERRam with ABL for AL, TT and HW were 95.4%, 38.4% and 91.3%; and for MBL 93.7%, 55.7% and 40.6%, respectively.
CONCLUSIONS The centile distribution of iERR is a useful complement to group mean estimates and better suited to detect suboptimal responses to anthelmintics.
DISCLOSURE Nothing to disclose.

PS2.007

Strongyloides stercoralis larvae excretion patterns before and after treatment

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INTRODUCTION The variability of larvae excretion impedes the parasitological diagnosis of the soil-transmitted helminth *Strongyloides stercoralis* in infected individuals. In particular, low-intensity chronic infections may be missed because of the low number of larvae excreted. The objective was to determine possible differences in larvae excreted by infected individuals and to assess the effect of treatment with ivermectin.
MATERIALS AND METHODS Using a modified Baermann diagnostic method, we assessed the number of larvae excreted per gram (LPG) stool in 219 samples from 38 infected individuals over seven consecutive days before and in 470 samples from 44 persons for 21 consecutive days after ivermectin treatment (200 μg/kg BW). We assessed for a possible cyclic excretion pattern by using local maxima calculation. We compared the observed local maxima in the larvae excretion counts within individuals with the number of local maxima in randomly generated numbers. A local maximum was identified when the LPG on a certain day was higher than the counts of the previous day and the following day.
RESULTS The diagnostic sensitivity of a single stool sample was 75% for individuals with low-intensity infections (<1 LPG) and increased to 95% for those with high-intensity infections (>10 LPG). Doubling the number of samples examined per person increased the sensitivity to more than 95%, even for low-intensity infections. There was no indication of a cyclic excretion of larvae. After treatment, all individuals stopped excreting larvae within 3 days. Larvae were not detected during any of the following 18 days (total 388 Baermann and 388 Koga Agar tests).
CONCLUSIONS The sensitivity of the Baermann technique increased with the infection intensity and the number of analysed stool samples. At least two stool samples, collected on consecutive days, are recommended to examine for a satisfactory sensitivity. Three days post-ivermectin treatment *S. stercoralis* larvae were no longer detectable.
DISCLOSURE Nothing to disclose.

PS2.008

Occurrence of and risk factors for *Strongyloides stercoralis* infection globally and in South-East Asia

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INTRODUCTION The soil-transmitted helminth *Strongyloides stercoralis* is one of the most neglected helminth infections. It is present world-wide, but more prevalent in hot and humid climates and resource poor countries where inadequate sanitary conditions prevail. The difficult diagnosis and irregular excretion of larvae lead to an underreporting of infection rates. We reviewed studies of the last 25 years on *S. stercoralis*'s global prevalence in general populations and risk groups.
MATERIALS AND METHODS A literature search was performed. A Bayesian meta-analysis was carried out to obtain country-specific prevalence estimates. Including the sensitivity of diagnostic methods applied, we modeled and mapped country-wide prevalence estimates. The modeling was divided into studies reporting infection rates in the general population, in hospitals and on refugees and immigrants, respectively. We further summarized possible risk factors for *S. stercoralis* infection using meta-analysis.
RESULTS A total of 354 studies from 78 countries were included for the prevalence calculation, 194 (62.4%) were community-based studies, 121 (34.2%) were hospital-based studies and 39 (11.0%) were studies on refugees and immigrants. World maps with country data are provided. In numerous African, Asian and South-American resource-poor countries information on *S. stercoralis* is lacking. The meta-analysis showed an association between HIV-infection/alcoholism with *S. stercoralis* infection (OR: 2.17 BCI: 1.18–4.01; OR: 6.69; BCI: 1.47–33.8), respectively. Our results show high prevalence estimates in many resource poor tropical and subtropical countries and in particular in South-East Asia. Whereas data is very limited in most South-East Asian countries, Thailand is a notable exception with more than 40 studies reporting data on the prevalence of *S. stercoralis*.
CONCLUSIONS Adequate information on the prevalence of *S. stercoralis* is still lacking from many countries. Further assessments in different socio-economic and ecological settings are needed and integration into global helminth control is warranted. *S. stercoralis* should not be neglected and adequate interventions assuring access to adequate treatment are warranted.
DISCLOSURE Nothing to disclose.