Screening returning migrants: parasitic/tropical infections

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15th ESCMID Summer School. 2 - 9 July 2016, Seville, Spain

Screening migrants
Practical / Technical issues

- A vulnerable population
- Legal and economical aspects
- Location of screening: pre-departure; on-arrival; post-arrival
- Target population
  - Screening to all asymptomatic or only to symptomatic migrants?: Fever, eosinophilia, abnormal urine, abnormal EKG, etc.
  - Define diseases to screen according to country of origin?
- VFRs screening?
- Pregnant women screening?
- Adopted children screening?
- Immunosuppressed screening?

Screening tools

Is there any rationale for screening? Screening is useful when:
- Infection is sufficiently present in the population
- Detecting the infection may lead to a cure
- The earliest the diagnosis, the most efficacious the cure
- Detecting the infection in an individual patient may protect the community

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Should we screen migrants for malaria? (1)

- **To whom?**
  - *Plasmodium falciparum*: Africa, Southeast Asia, India, South America
  - *Plasmodium vivax*: Central America, South America, Asia, Middle East
  - *Plasmodium ovale*: West Africa
  - *Plasmodium malariae*: all tropical areas
  - *Plasmodium knowlesi*: Southeast Asia

- **When?**
  - Most imported cases of malaria, particularly those caused by *P. falciparum* present in the first 3 months after arrival
  - Within the first 12 months after arrival (consider up to 3 years)
  - An important proportion of immigrants may be asymptomatic on arrival
  - VFR travelers
  - Would prevent misdiagnoses leading to delayed treatment

Should we screen migrants for malaria? (2)

- **Which laboratory test is advised for screening?**
  - Thick/thin blood smears
  - RDT antigen detection test (sensitivity is low when parasitemia <200/μl)
  - PCR is, by far, the most powerful tool for such surveillance.
  - Serology

- **Pre-departure treatment?**
  - Pre-departure treatment of *P. falciparum* malaria in asymptomatic immigrants and refugees from certain sub-Saharan countries as a cost-benefit measure.

- **Transmission?**
  - No significant risk as competent vectors absent in non-endemic areas.
  - Congenital, transfusional or organ transplantation-associated transmission

Australia

- Malaria
  - Symptoms, including fever, may have developed by the time of travel to Australia and may continue for weeks or months after departure.
  - You may be tested for malaria at the same time as other tests for traveler's diarrhea or jaundice.

- Pre-departure treatment
  - Pre-departure treatment of *P. falciparum* malaria in asymptomatic immigrants and refugees from certain sub-Saharan countries as a cost-benefit measure.

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Canada

- Recommendations for Post-arrival Presumptive and Directed Treatment for Malaria for Refugees from Sub-Saharan Africa
  - Refugees who have received pre-departure presumptive or directed treatment
  - Refugees who have received directed treatment with a chemotherapeutic agent

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Should we screen migrants for intestinal parasitoses? (1)

**To whom?**
- Worldwide but mainly in tropical countries in areas of poor sanitation
- Giardia has a worldwide distribution and is the most common infective protozoan parasite identified in humans

**When?**
- Highest rate in recently arrived immigrants. Most of the intestinal parasites will clear without treatment 1-2 years after migration. Screen to those who have arrived within the last 6–12 months or if eosinophilia is detected, regardless of the time since arrival.

**Which laboratory test is advised for screening?**
- 2-3 stool samples, concentration techniques for ova & parasites
- Kinyoun stain
- *Giardia / Cryptosporidium* RDT antigen detection
- Serology (*E.histolytica*)
- PCR

Should we screen migrants for intestinal parasitoses? (2)

**Mass treatment?**
- Presumptive treatment with albendazole in immigrants coming from areas at high risk could save money. However, this is not free of potential toxicities and the risk of treatment (especially relevant in Latin American populations with a high prevalence of cysticercosis) or the possibility of not treating certain species correctly.

**Treatment of positive cases?**
- Albenza: resistance to metronidazole

**Transmission?**
- Protozoa: risk of food contamination by asymptomatic carriers. Transmission through certain sexual practices possible (*Giardiasis*, *amoebiasis*)
- Soil-transmitted helminths: no significant risk of transmission

Should we screen migrants for strongyloidiasis?

**To whom?**
- Mainly in tropical countries

**When?**
- At any time after arrival. *S. stercoralis* may persist for decades and can produce future severe manifestations in the presence of immunosuppression or HTLV-1 infection.

**Which laboratory test is advised for screening?**
- Classical fecal concentration techniques (Baermann method)
- Agar plate culture of stool samples
- Serology (cross reactions)
- Real time-PCR in stools

**Treatment of positive cases?**
- Albendazole or ivermectin? 1 or 2 doses? Risk of ivermectine if *Loa loa*
- If eosinophilia? Treat and Test OR Test and Treat?
- If HTLV-1 or immunosupression?

**Transmission?**
- No significant risk of transmission
To whom:
- Mainly to high-risk sub-Saharan African immigrants
- S.mansoni: Africa, parts of South America
- S.hematobium: Africa, Middle East
- S.japonicum: Indonesia, parts of southeast Asia and China
- S.mekongi: Cambodia, Laos
- S.intercalatum: West and central Africa

When:
- At any time after arrival. Sub-clinical infections or low-grade disease can persist for decades after immigration and may cause future morbidity
- Mainly when eosinophilia or hematuria is detected

Should we screen migrants for schistosomiasis? (1)

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Should we screen migrants for schistosomiasis? (2)

### Which laboratory test is advised for screening?
- Detection of Schistosoma eggs in urine or stool samples (sens <50%)
- Biopsy samples from the bladder mucosa, rectal mucosa, and liver
- Antigen detection is only currently available for S. mansoni
- Species-specific IgG is currently available for S. mansoni
- Specific serology has a sensitivity and specificity >90% when combining two different techniques (indirect hemagglutination test [IHA] and ELISA), but does not discriminate between species
- PCR in stool, urine, blood and tissue samples (sens>97%, spec >90%).

### Treatment of positive cases?
- PZQ: 40 or 60 mg/Kg. Praziquantel can reverse previous established hepatic fibrosis. Early screening and treatment could avoid the development of bladder cancer transmission?
- Snail vectors absent
Should we screen migrants for filariasis?

- To whom?
  - West, central-east Africa, Middle East, Asia, South America, Caribbean, Pacific
- When?
  - Any time after migration as can survive for decades
  - Mainly to those with symptoms and/or eosinophilia
- Which laboratory test is advised for screening?
  - Peripheral blood samples extracted at night/day time
  - Immunochromatographic card tests for bancroftian filariasis
  - Skin snip samples
  - Serology
  - PCR
- Treatment of positive cases?
  - Mass treatment is not indicated as co-infections can occur
  - Risk of ivermectine in Loa loa
- Transmission?
  - Does not occur in areas where vectors are absent

Should we screen migrants for Chagas disease?

- To whom?
  - Latin America (except the Caribbean) migrants
  - Those persons born of Latin American mothers
  - Blood/organ donors
  - Pregnant/newborns
- When?
  - Systematic screening for Chagas disease at any time in immigrants from endemic areas is justified as they may be asymptomatic for long periods.
  - There is a risk of fatal cardiac events, and the possible transmission outside endemic areas (vertical and transfusion-related)
- Which laboratory test is advised for screening?
  - Serology
  - PCR

Estimated global population infected by Trypanosoma cruzi, 2009. As a consequence of immigration, Chagas disease has overcome the borders of the Latin American endemic countries and has settled in North America, Western Europe and Western Pacific regions.

Estimated cases of Chagas disease and number of Latin American migrants in the EU/EEA and Switzerland.
Should we screen migrants for Chagas disease? (2)

• Treatment of positive cases?
  • Benznidazole / Nifurtimox: risks and benefits
  • 20–40% will develop visceral involvement, mainly dilated cardiomyopathy and/or enlarged viscera and rarely polyneuropathy. Gastrointestinal involvement is less common (mainly in patients from the Southern Cone). Risk factor for stroke.
  • Immunosuppressed (HIV)
  • Treatment of nonpregnant fertile women to decrease vertical transmission

• Transmission?
  • No significant risk of vector-borne transmission
  • Blood and organ donation
  • Mother-to-child (7%)

Should we screen migrants for cysticercosis?

• To whom?
  — Worldwide

• When?
  — It is not indicated

• Which laboratory test is advised for screening?
  — Serology
  — CAT / MR

• Treatment of positive cases?

• Transmission?
  — Patients infected with *T. solium* tapeworm may lead to cases of cysticercosis through direct contact or if handled food is contaminated with eggs.
Thanks very much for your attention