
Intestinal parasites

Comparison of different diagnostic microscopy procedures

as a tool for epidemiological research
Beira - Mozambique

Mozambique study

- High prevalence of diarrhoea and abdominal complaints in slums Beira – Inhamudima
- Local hospital:
 - Direct smear standard method
 - Only 2 parasitic infections per year
 - No *S. stercoralis* in this area
- Aim:
 - population based pilot survey
 - age and gender distribution intestinal parasites
 - relation with history of diarrhoea
 - validation of microscopic procedures

Stool/urine examination for

- *G. lamblia*
- *E. histolytica / dispar*
- *Cryptosporidium spp.*
- *C. cayetanensis*
- *I. belli*
- Non-pathogenic protozoa
- *E. bieneusi*
- *E. intestinalis*
- *S. stercoralis*
- Hookworm
 - *A. duodenale*
 - *N. americanus*
- *A. lumbricoides*
- *T. trichiura*
- *S. mansoni / haematobium*
- *Taenia spp. + others*

Microscopy in Beira

- Intestinal Protozoa
 - Direct Smear
 - Ridley
 - Ziehl-Nielsen
 - *Strongyloides stercoralis*
 - Direct Smear
 - Ridley
 - Baermann
 - Copro-culture (single)
 - Other helminths
 - Urine Sedimentation
 - Direct Smear
 - Glycerin Sedimentation
 - Ridley
 - Kato
 - Copro-culture (single)
- In total: 8 diagnostic methods

Results summary (n= 303)

Parasite	Positive microscopy	Positive PCR
Giardia	8%	37%
Cryptosporidium	1%	2%
Microsporidia	n.p.	9%
Strongyloides	33%	44%
Hookworm	33%	35%
Ascaris	54%	54%
Trichuris	93%	n.p.
Schistosoma mansoni	2%	n.p.
Schistosoma haematobium (n=101)	(6.1%)	n.p.

Strongyloides - diagnosis

	Copro-culture		Total
	Baermann	Positive	
Positive	56	14	70
Negative	27	206	233
Total	83	220	303

• Baermann = Culture (McNemar P= 0.06)

Summary – Mozambique - helminths

- Prevalence of *Strongyloides* (48%) much higher than expected
- Together with hookworm (38%)
 - Sensitivity ~ number of techniques
 - Copro-culture additional to Ridley
 - PCR sensitive (but not 100%) + differentiation
- *Ascaris* (56%) and *Trichuris* (93%)
- *Ascaris* in direct smear 147/169 cases (87%)
- Glycerine most sensitive technique (Ridley)
- PCR *Ascaris* more for (epidemiological) research

In the Netherlands?

Strongyloides and hookworm

- The more microscopy the better?
- Use Copro-culture (often stool older; Baermann less sensitive)
- Validate in your own target population!!!
- *Strongyloides* => use serology
- (PCR)

Ascaris and Trichuris

- Ridley mostly enough
- Glycerine to detect light infections