Brief communication

Comparison of different Kato templates for quantitative faecal egg count of intestinal helminth parasites

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Introduction

Estimating the intensity of infection is crucial for. estimating morbidity due to intestinal helminth parasites (1) .The intensity of infection of most intestinal helminth parasites is indirectly estimated by quantitative faecal egg count which, in turn, is used for estimating the worm burden (2). Along this line, the quantitative Kato's thick smear method is the most widely used because of its simplicity , low cost, adaptability to the field and adequate sensitivity (3). However , because of the various modifications that are available (50mg, 41.7mg and 20mg templates) comparison of results have been quite difficult. The modifications are based on variations in the thickness and diameter of the template which, in turn, determines the amount of the faecal matter delivered on the slide.

In Ethiopia, the Kato ' s thick smear method with the 20mg template was introduced in 1978 by the Institute of Pathobiology, Addis Ababa University , for quantitative survey of intestinal schistosomiasis. Although the slides prepared using the 20mg Kato method clear relatively rapidly and are readable within about 30 minutes there has been some doubt about its accuracy in estimating the intensity of infection especially in light infections because of the relatively smaller faecal matter delivered. To clear this doubt and also to test the comparability of privious data of the investigators with those from other countries Ethiopia which are generated using different templates, the three types of templates (50mg, 41.7mg and 20mg) were tested in the quantitative determination of faecal egg counts of Ascaris and Trichuris in the Ethiopian situation.

Methods

Ten children positive for Ascaris and/or Trichuris were selected and for each individual Kato slides were prepared using all templates (50mg, 41.7mg and 20mg) in triplicate from the same faecal matter. Each slide was scanned using the l0x magnification and all eggs of Ascaris and Trichuris counted using a hand tally counter. The number of eggs per slide was multiplied by 50, 24 and 20 for the 20 mg, 4l.7mg and 50mg templates, respectively, in order to convert to eggs per gram of faeces (EPG). For each individual, average EPG was then recorded by the three templates. Based on these average EPGs the arithmetic means, standard deviations (SD) and 95% confidence intervals (C.I) were calculated for all individuals and templates from l0g transformed data.

Encouraged by lack of significant variations in the mean egg counts between the templates when three slides are prepared from the same faecal matter for each template, the testing was repeated on 24 other children who were positive for Ascaris and/or Trichuris. This time only single slides were prepared for each template from the same faecal matter. After multiplying by the factors shown above the arithmetic means, SDs and 95% C.Is. of the egg counts were calculated for all individuals and templates fron11og transformed data.

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Results and Discussion

The results of stool examination by each template when triplicate and single slides were prepared are presented in Tables 1 and 2. For Ascaris and Trichuris the arithmetic means, SDs and 95% C.1s are more or less similar for all templates both when triplicate and single slides were prepared. For all templates the SDs are similarly small lying within the range of 20-25% from the mean, i.e. coefficients of variation were small. The 20mg template appears to exaggerate the egg counts slightly but the differences are not significant ($p>0.05$).

Table 1: Comparison of 50, 41.7 and 20mg templates for counting Ascaris and Trichuris eggs in human faecas when tripllcate sllde are used per person

	Templete		
	50mg	**41.7mg**	**20mg**
Ascaris			
No. of stool samples	24	24	24
Mean ±SD	3.3±0.7	3.3±0.7	3.4±0.8
C.I	3-3.6	2.9-3.5	3.0-0.8
Trichuris			
No. of stool samples	24	23	24
Mean ± SD	2.2±0.5	2.1±0.5	2.3±0.5
C.I	2.0-2.4	1.9-2.3	2.1-2.5

Table 2: comparison of 50,41.7 and 20 mg templates for counting of Ascaris and Trichuris eggs in human faeces when a single sllde is used per person.

	Templete		
	50mg	**41.7mg**	**20mg**
Ascaris			
No. of stool samples	18	18	18
Mean I SD*	3.4±0.7	3.5±0.8	3.6±0.9
95% C.I	3.2-3.8	3.1-3.8	3.2-4.0
Trichuris			
No. of stool samples	24	24	24
Mean SD	2.6±0.6	2.5±0.7	2.7±0.7
95 % C.I	2.3-2.8	2.2-2.7	2.4-3.0

The geometric mean egg count is often used for estimation of the intensity of infection in the entire population or its segment (2, 4). 10. this study the geometric mean egg counts were similar for all templates both when single and triplicate slides were prepared for an individual indicating that any of the 'templates could be used in an epidemiological study of intestinal helminths. Hence, the data generated in this study using the 2Omg could be comparable with data generated using the 41.7mg or 50mg templates in other countries from the template view point.

Egg counts are considered to be usefully representative of a worm burden if the values fall within a range of 20% on either side of the total mean egg count (mean :t 20%) (5). In this study, the coefficients of variations ranged from 20-25% for all templates and for-both parasites indicating the reliability of any of the templates in estimating the worm burden of intestinal helminths in this study population. Hence, the use of the 20mg template is recommended for the epidemiological study of intestinal helminths in Ethiopia. However , since egg counts have been related to the diet of the population (5), further testing of the 20mg template may be necessary under different dietary situations. In areas where the population consumes injera (the Ethiopian pancake-like food of "red teff" even the 2Omg template appears to be less sensitive because of the brownish colour of the faeces which hinders transparency of the slide (personal observations).

Reference

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