TRANSACTIONS OF THE ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE (2003) 97, 373–374

No effect of recall period length on prevalence of self-reported haematuria in *Schistosoma haematobium*-endemic areas

Marieke J. van der Werf[1], Gerard J. J. M. Borsboom[1] and Sake J. de Vlas[1,2] *[1]Department of Public Health, Erasmus MC, University Medical Center Rotterdam, P.O. Box 1738, 3000 DR Rotterdam, The Netherlands; [2]Prince Leopold Institute of Tropical Medicine, Nationalestraat 155, B-2000 Antwerp, Belgium*

Abstract

Assessing prevalence of haematuria by interview is commonly used as a rapid method to identify communities for mass treatment of *Schistosoma haematobium* infection. We analysed, using 21 published studies, to what extent the prevalence estimates of haematuria were affected by the length of the recall period for which respondents were requested to report symptoms. There was a strong positive association between prevalence of haematuria and infection, but no effect of recall period length. This suggests that the choice of recall period is of minor importance in control programmes or studies based on reported haematuria.

Keywords: schistosomiasis, *Schistosoma haematobium*, haematuria, prevalence, recall period length, Africa

Introduction

Haematuria, the main early symptom of urinary schistosomiasis due to *Schistosoma haematobium* infection, is frequently measured by questionnaire (i.e. by asking individuals if they have had blood in their urine). Commonly, a recall period of 2–4 weeks is used. This method enables rapid and relatively inexpensive identification of communities for mass treatment of this important parasitic disease, and is recommended by WHO (Lengeler *et al.*, 2002; WHO, 2002). Several studies have shown that prevalence of self-reported haematuria is a convenient proxy for prevalence of infection (Lengeler *et al.*, 1991; Guyatt *et al.*, 1999).

In retrospective questionnaire surveys of medical events, recall bias is one of the factors that may affect outcomes. Especially for less significant events (such as haematuria), and the frequency, duration and meaningfulness of the event may contribute to recall bias (Coughlin, 1990). Furthermore, as haematuria is intermittent, the prevalence of reported haematuria is expected to increase with the duration of recall period. It is important to assess the effect of recall period length on the prevalence of reported haematuria. Only 2 studies have used different recall periods. Adom *et al.* (1992) reported a higher prevalence for haematuria 'ever' compared with current haematuria. The other study showed inconsistent results as the prevalence reported for 'last week' was lower than that for the last 24 h (Warren *et al.*, 1979). We aimed to assess the effect of recall period length on the association between prevalence of reported haematuria and *S. haematobium* infection using data from field studies with different and more commonly applied recall periods.

Methods

We collected all articles published before 2002 that reported prevalence of haematuria measured by questionnaire with a maximum recall period of 4 weeks and prevalence of *S. haematobium* infection in unselected, untreated study populations in Africa. Prevalence of infection had to be based on standard filtration of a 10 mL urine sample or a method with comparable sensitivity: namely, filtration, centrifugation, or sedimentation of 5–20 mL urine samples. Twenty-one studies were included in a meta-analysis, including 117 schools (10 studies) and 14 communities (11 studies); 10 studies were performed in East, 6 in North, and 5 in West Africa. Every community or school was included as 1 observation in the analysis, so 1 study could contribute several observations. Recall periods in the included studies were 1 d, 1 week, 2 weeks, and 4 weeks, represented by 1, 2, 53, and 58 observations, respectively. For 17 data points, the period was not specified. The impact of recall period length, study setting (school vs. community), and geographical location (East Africa vs. North and West Africa) on prevalence of haematuria was examined by analysis of covariance, using prevalence of infection as a covariate.

Address for correspondence: Marieke J. van der Werf, Department of Public Health, Erasmus MC, University Medical Center Rotterdam, P.O. Box 1738, 3000 DR Rotterdam, The Netherlands; phone +31 10 4087714, fax +31 10 4089449, e-mail vanderwerfm@kncvtbc.nl

Results

A wide range of endemicity levels was present, as the prevalences of *S. haematobium* infection varied from 0 to 85% (Figure). There was a strong positive association ($r = 0.81$, $P < 0.0001$) between prevalence of infection and reported haematuria in the total data set. No significant main effect of recall period length on prevalence of haematuria was found ($P = 0.40$) and there was no significant interaction effect between recall period length and prevalence of infection ($P = 0.12$). This implies that the relationship between prevalence of haematuria and infection did not differ between the 4 recall periods. Furthermore, there was no significant effect of geographical location ($P = 0.48$) and study setting ($P = 0.91$), the latter of which can be considered a proxy for age. The final model for prevalence of haematuria only contained prevalence of infection, having a regression line with a slope of 0.51 (95% CI 0.44–0.58) and intercept of 8.7 (95% CI

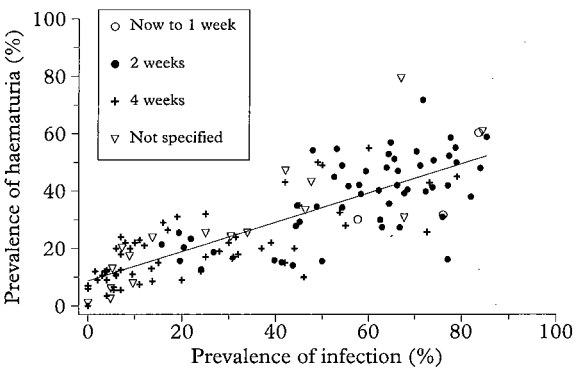

Figure. Association between prevalence of *Schistosoma haematobium* infection and reported haematuria for different recall periods. Every point represents 1 school or community. The regression line is $y = 8.7 + 0.51x$, with 65% of the variance explained. [Sources of data are reported in *Morbidity and infection with schistosomes or soil-transmitted helminths* by M. J. Van der Werf & S. J. De Vlas, unpublished report at the request of WHO/PVC/CPE.]

5.6–11.8). The small intercept represents misclassification or haematuria from other diseases. The great majority of data points (80%) came from 2 studies in Tanzania. These studies did not unduly influence the results because their regression lines did not differ significantly from each other, nor from that of the other 19 studies combined.

Discussion

Testing the effect of recall period length on reported haematuria would ideally be done in an experimental context. However, we believe that the evidence of no effect of recall period length on the association between prevalence of haematuria and *S. haematobium* infection, as shown in our study using literature data, is convincing. This finding can be explained by the possibility that intervals between consecutive episodes of haematuria are short (days) compared to the recall periods (weeks). Also, potential effects of recall period length may be neutralized by 2 possible mechanisms. First, memory decay (failure to remember the event) may have caused underreporting of haematuria that ended between 2 and 4 weeks ago, as haematuria is often not regarded as a serious symptom in endemic areas. Second, reporting events that occurred outside the recall period (telescoping) might have been more important for the shortest recall periods.

Earlier studies have shown that the prevalence of haematuria as measured by questionnaire provides a simple and adequate method for community diagnosis due to its strong association with prevalence of infection. It is reassuring that this association is consistent for different studies as shown in our meta-analysis. The choice of recall period (2 or 4 weeks) proves to be of minor importance. This is of operational importance for community treatment programmes and strengthens the case for using questionnaires as a simpler, cheaper alternative to urine examination.

Acknowledgements

We gratefully acknowledge Agnes van der Heide and Hans Brug for their critical comments. This study was performed as part of the multidisciplinary programme 'Model-based decision support for schistosomiasis control in Ghana, Mali, Niger and Senegal' funded by The Netherlands Foundation for the Advancement of Tropical Research (WOTRO) and was also funded by the Department of Communicable Diseases Control, Prevention and Eradication, World Health Organization, Geneva, Switzerland. The funding sources had no involvement in study design, collection, analysis and interpretation of the data, the writing of the report, or the decision to submit the paper for publication.

References

Adom, H., Guerin, B., Commenges, D. & Le Bras, M. (1992). L'hématurie comme indicateur des bilharzioses urinaires en campagne de masse: à propos d'une enquête au Burkina-Faso. *Médecine d'Afrique Noire*, **39**, 550–556.

Coughlin, S. S. (1990). Recall bias in epidemiologic studies. *Journal of Clinical Epidemiology*, **43**, 87–91.

Guyatt, H., Brooker, S., Lwambo, N. J. S., Siza, J. E. & Bundy, D. A. P. (1999). The performance of school-based questionnaires of reported blood in urine in diagnosing *Schistosoma haematobium* infection: patterns by age and sex. *Tropical Medicine and International Health*, **4**, 751–757.

Lengeler, C., de Savigny, D., Mshinda, H., Mayombana, C., Tayari, S., Hatz, C., Degremont, A. & Tanner, M. (1991). Community-based questionnaires and health statistics as tools for the cost-efficient identification of communities at risk of urinary schistosomiasis. *International Journal of Epidemiology*, **20**, 796–807.

Lengeler, C., Utzinger, J. & Tanner, M. (2002). Questionnaires for rapid screening of schistosomiasis in sub-Saharan Africa. *Bulletin of the World Health Organization*, **80**, 235–241.

Warren, K. S., Mahmoud, A. A., Muruka, J. F., Whittaker, L. R., Ouma, J. H. & Arap Siongok, T. K. (1979). Schistosomiasis haemotobia in coast province Kenya. Relationship between egg output and morbidity. *American Journal of Tropical Medicine and Hygeine*, **28**, 964–870.

WHO (2002). *First Report of the Joint WHO Expert Committees on the Prevention of Schistosomiasis and Soil-transmitted Helminthiasis*. Geneva: World Health Organization, Technical Report Series, No. 912.

Received 6 December 2002; revised 31 March 2003; accepted for publication 3 April 2003

Book Review

Conquest of Scourges in Myanmar. General Perspectives, Smallpox, Leprosy, Trachoma, Iodine Deficiency and Poliomyelitis. Yangon: Myanmar Academy of Medical Science, 2002. xvi + 476 pp. Price and ISBN not known.

Myanmar (Burma) lies partly within the tropical zone and therefore has its fair share of tropical diseases and this compilation, under the auspices of the Myanmar Academy of Medical Science, aims to '...depict an unbiased and correct account of how the health scientists and the people of Myanmar collaborated in their efforts to combat these scourges and how these scourges are being conquered'. The first chapter is a general perspective of the country, its people and the principal endemic diseases. There are further chapters on the eradication of smallpox and poliomyelitis, the elimination of leprosy and control of trachoma and iodine deficiency disorder. These are success stories, all 5 diseases have either been eliminated or are well on their way to elimination, and the main emphasis of this book is on how these successes have been achieved including information on the planning and organization of the various programmes. There is a considerable amount of interesting data and this book is likely to be of interest to epidemiologists and those concerned with the day-to-day handling of disease control programmes. Only 1600 copies of this book have been printed and further information can be obtained from the Myanmar Academy of Medical Science, No. 27 Pyidaungsu Yeiktha Road, Yangon, Myanmar.

F. E. G. Cox

Department of Infectious and Tropical Diseases
London School of Hygiene and Tropical Medicine
Keppel Street
London WC1E 7HT, UK