Evaluation Of Detection Of Haematuria And Proteinuria Using Reagent Strips As Screening Tests For Schistosoma Haematobium Among School Children

THESIS

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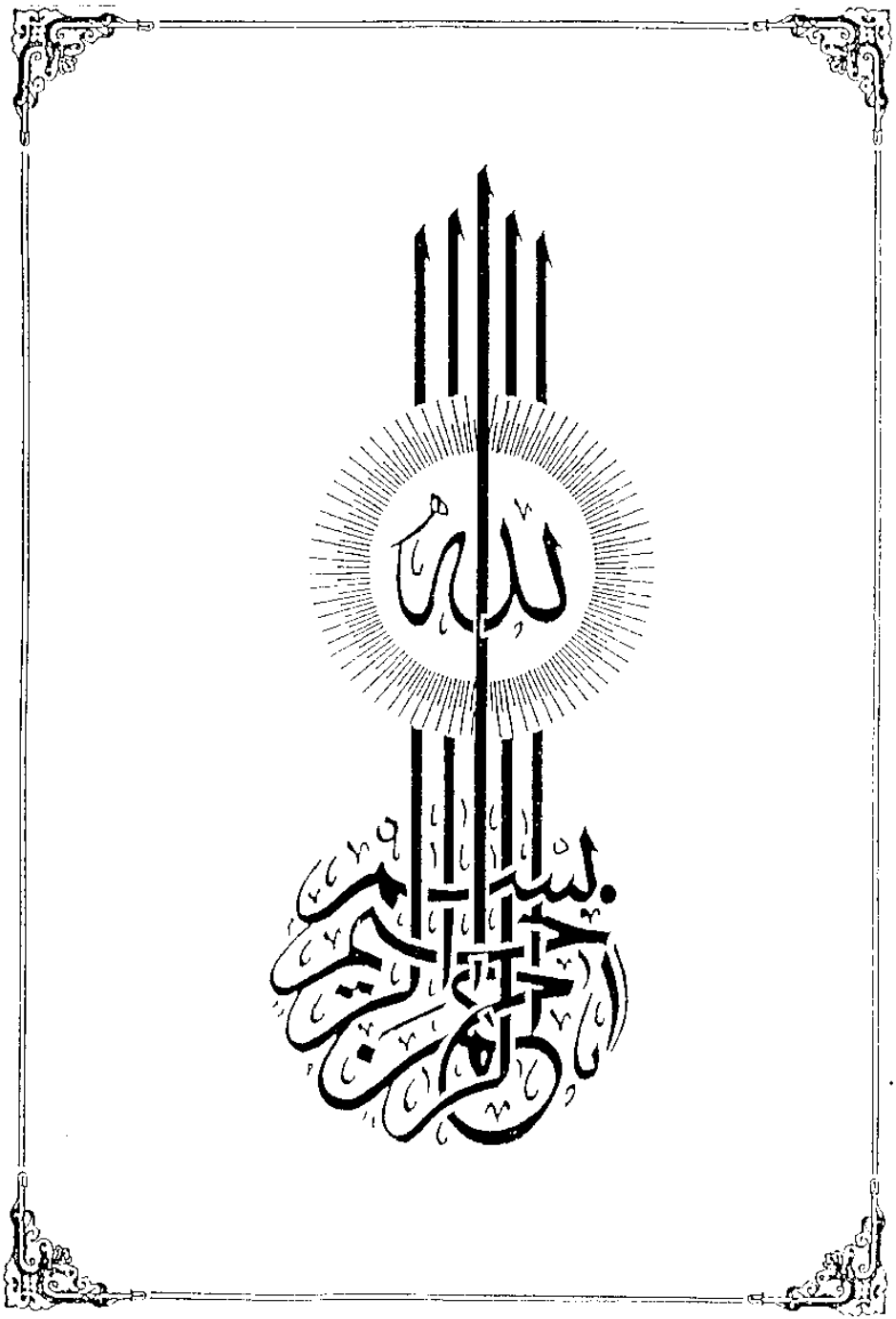

List Of Abbreviations

- +ve pr. v. = Positive predictive value .
- Haem. = Haematuria .
- Prot. = Proteinuria .
- S. haematobium = Schistosoma haematobium .
-S.H. = Schistosoma haematobium .

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INTRODUCTION

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Schistosomiasis is one of the most widespread parasitic infection that affects man . It is estimated that more than 200 million persons residing in rural areas are infected and that 600 million persons are at risk of infection ***(WHO , 1993)*** .

In Egypt , the disease is considered a major health problem due to its high prevalence especially among the rural population . The disease and its complications affect the production potential and thereby reduce the national income . Urinary schistosomiasis caused by Schistosoma haematobium infection , is prevalent in the Nile Valley from Aswan to Cairo and through the Delta ***(EL-Khoby et al ., 1991)*** .

Haematuria and proteinuria has long been recognized as an early sign of infection , and it has been shown that the degree of haematuria and proteinuria in children is related to the intensity of S.haematobium infection ***(Feldmeier et al ., 1982 , Mott et al ., 1985a , Murare & Taylor , 1987)*** .

Parasitological diagnosis of S.haematobium infection has been made considerably simple and more quantifiable by the development in filtration technique ***(Peters et al ., 1976)*** . However , it requires

trained personnel , equipment , time and effort for filtration of urine and microscopic detection and counting of the filtered eggs .

The use of more simple diagnostic technique that could be used efficiently by minimally trained health workers to identify infected persons would aid the implementation of Schistosomiasis control programmes . Rapid diagnosis followed by treatment of infected persons with the safe , highly effective , oral single dose anti-schistosomal drugs would expected to reduce the morbidity related to schistosomiasis , which is the strategy of the control of the disease ***(WHO , 1993)*** .

The use of urine analysis reagent strips for detection of haematuria and proteinuria was suggested by many investigators to be that simple and rapid way of diagnosing S.haematobium infection ***(Wilkins et al ., 1979 ; Murare and Taylor , 1987 ; Kiliku et al ., 1991)*** . However , the frequency and severity of appearance of blood and protein in the urine of infected persons were found to be community-specific that resulting in different values of sensitivity and specificity of haematuria and proteinuria observed in different countries ***(Tanner et al ., 1983 ; Mott et al ., 1985a ; Murare and Taylor ., 1987 ; Nwaorgu and Anigba , 1992)*** . So , results of reagent strips obtained at one locality can not always be applied to another .

In a report of the WHO expert committee , 1985 , they stated that , urine analysis reagent strips must be evaluated and compared with the quantitative parasitological techniques , locally , before their widespread use in that area . Hence , the evaluation of detection of haematuria and proteinuria using urine analysis reagent strips as a screening test for S.haematobium infection , and the finding of a local diagnostic reagent strips criterion are of utmost importance .

AIM OF THE WORK

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1-To study the relationship between haematuria or proteinuria and the intensity of Schistosoma haematobium infection .

2-To assess the validity of detection of haematuria and proteinuria , using urine analysis reagent strips , as a screening test for Schistosoma haematobium infection .

3-To find out the best local diagnostic criterion for Schistosoma haematobium infection based on the results of reagent strips .

4-To assess the reliability of haematuria and proteinuria as detected by reagent strips .

REVIEW OF LITERATURE

EPIDEMIOLOGY OF SCHISTOSOMIASIS

Schistosomiasis as a global problem

Schistosomiasis is one of the most widespread parasitic infection that affects man. It is estimated that 200 million people are infected and 600 million are at risk of developing the disease. The disease is endemic in 74 countries of the world. S. haematobium is endemic in 54 countries, mainly in Africa and the eastern Mediterranean ; S. mansoni is endemic in 52 countries of South America, the Caribbean, Africa, and the eastern Mediterranean ; and both parasites are present in 41 countries of Africa and the eastern Mediterranean. Schistosoma intercalatum has been reported from equatorial Guinea as the only species present another 9 countries in the African region with S. haematobium and \ or S. mansoni as well. Either S. japonicum or S. mekongi has been reported from 7 south east Asian and western Pacific countries. S. malayensis, a species related to S. mekangi has been reported from Malaysia ***(WHO ,1993).***

Schistosomiasis in Egypt

Schistosomiasis, a disease that has been endemic in Egypt since the pharaonic era, is considered a major health problem due to its high prevalence among the Egyptians ***(El Khaby et al., 1991).*** The total numbers of infected individuals in Egypt was estimated to be 5-6 million in 1990 ***(WHO, 1993).***

The prevalence of the two species that are endemic in Egypt varies greatly from the upper to the lower Egypt : -In Upper Egypt S. haematobium is the predominant species with a prevalence rate ranging from 4.9 % in Giza to 13.8% in Fayoum. There are some known S. mansoni foci in Suhag and Qena governorates together with small foci in some villages in Fayoum ***(El Khobyet al., 1991)*** and in Assiut Governorate it is also focally transmitted in 2 villages ***(Medhat et al., 1993)***. In lower Egypt, S. mansoni is the predominant species when its prevalence ranges from 3.9 % in Nubariya to 38.6 % in Mid Delta, while the prevalence of S. haematobium ranges from 1.5 % in Nubariya to 6.2 % in Mid Delta ***(El Khaby et al., 1991).***

The distribution pattern of the two schistosoma species has been greatly changed since the first schistosoma survey has been done by Scott , 1937. At that time, S. haematobium was common in the Delta with a prevalence ranging from 55 % to 75 % , while the distribution of infection with S. mansoni varied widely , ranging from 60 % North of the Delta to 6 % in its southern part ***(Scott, 1937).*** In another study conducted by ***Van der Schalie***, 1958 the predominance of infection with S. haematobium in certain parts of Nile Delta was confirmed. He also reported that Bullinus snails were 10 times more common than Biomphalaria in canals from Qalyub region.

After twenty years , ***Abdel-Wahab et al., 1979*** found that, since 1972, there were far more snails for S. mansoni (Biomphalaria) than

for S. haematobium (Bullinus) in a ratio of about 26 Biomphalaria to 1 bullinus snails. and an increased prevalence of S. mansoni infection associated with a decreased prevalence of S. haematobium infection was also reported in Nile Delta by ***El Alamy and Cline , 1977 and Cline et al., 1989.***

This change could be explained by the construction of the Aswan High Dam that may have changed the ecological conditions (e.g. velocity of current, salinity, concentration of suspended particles in the silt or degree of irrigation) such that survival of Biomphalaria rather than Bullinus snail intermediate hosts is favored ***(Malek , 1975).***

El Khaby et al., (1991) considered this explanation an over simplification of an important problem deserving meticulous investigation to prevent the occurrence of a similar phenomenon elsewhere.

In most endemic areas, the highest prevalence and intensity of infection are found in children between 5-15 years of age especially males. In adulthood , chronic disease may develop and egg excretion may be lower or even zero. Susceptibility to sever disease varies between individuals , and is determined by the intensity of infection and to a lesser degree by immunogenetic factors. Reinfection is generally less frequent and less intense in adults than in children,