Hydrocele Estimation: A Parameter for Filariasis Prevalence

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Abstract

The estimation of filariasis prevalence in the past was relied upon clinical and microfilariae examination by night blood smear. Recently in the nineties with the introduction of Og4C3 ELISA, antigen detection became the accepted methodology for estimating filariasis prevalence. However these methods are costly and/or require laboratory processing. Hydrocele in males is one of the clinical manifestations of lymphatic filariaisis that can be estimated by questioning and examining the subjects. In a rural area of Panna district, Madhya Pradesh, 4% lymphoedema and 23% hydrocele cases were found. The overall CFA prevalence was found to be 36.7% in the study population. It was observed that contrary to lymphedema or elephantiasis a good percentage of patients with hydrocele were found positive for Circulating Filarial Antigen. In the context of Global Elimination of Lymphatic Filariasis by 2020, it has become more justified to quickly assess the disease burden in newer areas by assessment of hydrocele cases.

Introduction

Lymphatic filariasis (LF) caused by the filarial nematode *Wuchereria bancrofti* affects more than 115 million people worldwide as reported by Michael and Bundy (1997). In India, 18 states/union territories are known to be endemic for LF and 429 million people are at risk of infection with 29 million parasite carrier and 22 million chronic diseases accounting for 44% of the global burden (Reddy et al, 2000). LF is endemic in eleven districts of Madhya Pradesh in which MDA (Mass Drug Administration) with antifilarial drug is going on since 2004. There are various methods by which filariasis prevalence of an area can be estimated. In recent years with the availability of rapid tests like ICT Card the prevalence of periodic Bancroftian filariasis estimation becomes easy and less burden some (Weil et al, 1997). Though the antigen based methods (ICT & Og4C3 ELISA) are highly specific in detecting cryptic filarial infection (Chanteu et al, 1994; Weil et al,1997; Weerasooriya et al, 2002) these are costly and beyond the reach of programme implementers. Hydrocele survey can be an alternative for rapid assessment of filariasis in newer areas.

Material and Methods

The study was carried out in three villages of Ajaygarh block of Panna distrct, Madhya Pradesh, India. A door-to-door survey was carried out in the selected villages. Informed consent was obtained from study individuals. The clinical symptoms like lymphangitis, hydrocele and lymphoedema or elephantiasis were recorded. Individuals with clinical disease/ symptoms were examined by the investigator (clinician), following WHO guidelines. About 2 ml blood was collected from all the male individuals enrolled in the study. Sera were separated in the field and brought to the laboratory and stored at -20^0 C until tested. The Trop Bio ELISA kit was used for detecting and quantifying *W. bancrofti* antigen according to the manufacturer's (Tropical Biotechnology Pvt. Ltd. Townsville, Australia) recommendations. The results were expressed as arbitrary antigen units per ml using *Onchocerca gibsoni* antigen provided as standard in the kit (cut off =100 units / ml).

Results and Discussion

On clinical examination of the study individuals 23% males were found to be suffering from hydrocele (Table 1). The presence of lymphoedema was found to be 4% while acute lymphangitis was observed in 5% individuals. Among the study villages 32% individuals in Pista presented with filarial symptoms to that of only 4% individuals of Devpur. In Pista and Taroni the presence of CFA was more than 40% while it was less than 20% in Devpur. The presence of CFA in individuals more than 14 years of age ranged from 22% to 57%, while the prevalence of hydrocele was observed to be 5 to 22% (Table 2). It was observed that about 50% individuals having hydrocele also found positive for CFA.

Table 1: Clinical manifestations of filariasis

Name of the village	Lymphangitis No. Positive (%)	Hydrocele (males only) No. Positive (%)	Elephantiasis No. Positive (%)	CFA (%)	Asymptomatic individuals %
Pista N=332	23 (6.9)	72 (28.7)*	13 (3.9)	126 (38.1)	67.8
Taroni N=88	1 (1.1)	9 (15.0)	7 (8.0)	42 (47.7)	80.7
Devpur N=78	1 (1.3)	2 (4.0)	0	14 (18.2)	96.2
Total N= 498	25 (5.0)	83 (23.0)	20 (4.0)	182 (36.7)	74.5

*1 in both (Hyd+Ly)

Table 2: Prevalence of hydrocele and CFA in males more than 14 years of age.

Name of the village	Hydrocele (%)	Hydrocele cases positive for CFA (%)	CFA (%)
Pista N=173	72 (22.1)	37 (51.4)	82(47.4)
Taroni N=46	8 (9.1)	3 (37.5)	26 (56.5)
Devpur N=37	2 (5.4)	1 (50.0)	8 (21.6)
Total N=256	83 (16.7)	41 (49.4)	116 (44.0)

It was evident from Table 3 that ICT-Card test and hydrocele estimation were rapid methods in comparison to Night blood slide or Og4C3 ELISA and results can be estimated same day. The cost of hydrocele estimation was minimal and no equipment is required for this purpose.

Table 3: A comparison between different methods of filariasis survey (Calculated for 100 individuals.)

Name of the method	Time required for the test. (Days)	Approx. cost of consumables (Rounded to 100 rupees)	Equipments required
Night Blood slide	2	1100.00	Microscope
ICT-Card	1	26000.00	Nil
Og4C3 ELISA	3	13,400.00	ELISA Reader
Hydrocele survey	1	200.00	Nil

In endemic areas, genital involvement is one of the common clinical manifestations in males (Gyapong et al 2000). In some highly endemic areas of filariasis the prevalence of hydrocele went up to 50% or more and its role as a diagnostic index have been suggested (Gyapong et al, 1998). In our study, we examined patients with hydrocele who reported voluntarily. It was felt that many more individuals did not reveal their hydrocele status due to shyness and presence of other villagers. The self-reporting is also affected by their educational level and social status. It was observed that unlike lymphoedema cases, about 50% individuals with hydrocele were also found positive for CFA. These individuals were having active filarial infection and could be targeted for MDA. The various methods by which filariasis prevalence was estimated depend on the need and available resources. Presently the GPELF (Global Programme on Eliminatiomn of L ymphatic Filariasis) is implemented in 11 districts of Madhya Pradesh based on morbidity data available with state health departments. There is highly under reporting of hydrocele cases in state health centers as many individuals prefer quacks and private doctors for their illness. Keeping view of the elimination of filariasis by 2020, hydrocele estimation can be used in newer areas to study the prevalence of filariasis.

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