

LYMPHATIC FILARIASIS IN KHURDA DISTRICT OF ORISSA, INDIA: AN EPIDEMIOLOGICAL STUDY

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Abstract. A cross-sectional survey was undertaken to determine the prevalence of disease due to lymphatic filariasis in Khurda district of Orissa, India. The total disease attributable to filariasis was significantly higher in males (14.79%) than females (10.04%). However, elephantiasis is more prevalent in females, and adenolymphangitis is more prevalent in males than their counterparts. The prevalences of various forms of the disease are age dependent in both sexes. About one-seventh of men and women of higher age groups suffered from chronic debilitation forms of the disease. The study suggests that overt clinical forms of lymphatic filariasis constitute a major public health problem in the study area.

INTRODUCTION

Lymphatic filariasis is a major public health and socio-economic problem in India. In India, approximately 420 million people reside in endemic areas and 48.11 million are infected (Michael *et al*, 1996). All states and union territories of India except a few are endemic for lymphatic filariasis and State of Orissa is known for its higher endemicity (NFCP, 1995). A few studies have been carried out in the State of Orissa on some epidemiological aspects of lymphatic filariasis (Dash *et al*, 1998; Kumar *et al*, 1994, 1996; Kar *et al*, 1993; Rath *et al*, 1984, 1989). But relatively little is known about the age and gender specific prevalences of chronic conditions of lymphatic filariasis from this region. The chronic forms of the disease are assumed to be debilitating, leading to restriction in the economic productivity (Evans *et al*, 1993; Ramaiah *et al*, 2000). The present paper reports the age and gender specific prevalences of various forms of lymphatic filariasis from rural areas of Khurda district

of State of Orissa, India.

MATERIALS AND METHODS

The cross-sectional study was carried out in 12 villages in Khurda district of Orissa, India. The study area is rural in nature and its inhabitants vary in socio-economic status, from low to middle income class. They mainly depend on agriculture and related activities, such as agricultural labor. The study area is known for its endemicity for lymphatic filariasis caused by *Wuchereria bancrofti*, which is mainly transmitted by *Culex quinquefasciatus* (Dash *et al*, 1998).

The present study was undertaken during a period of three months from May 1999. In these 12 villages, door-to-door survey was conducted and all available subjects were investigated. Every subject was informed the purpose of the study and his/her consent was obtained. Each subject was examined for acute or chronic signs and symptoms of lymphatic filariasis, *ie*, lymphedema (elephantiasis), scrotal swelling (hydrocele), breast swelling and hand swelling. The information on the occurrence of episodic attacks of adenolymphangitis (ADL) during previous three months was obtained. An acute ADL episode was defined by the presence of local signs and symptoms such

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as pain, tenderness, local swelling and warmth in the groin with or without associated constitutional symptoms such as fever, nausea or vomiting. The investigators explained these terms in local language (Oriya), which are very common in the study area.

RESULTS

The summary of clinical examination of 5,357 individuals is shown in Table 1. The chronic condition of lymphatic filariasis, namely lymphedema (elephantiasis) and hydrocele are more prevalent in the study population. The elephantiasis alone is recorded among 2.46% and 4.51% of men and women respectively. The men recorded 4.10% prevalence of hydrocele. A few people are affected by more than one form of lymphatic filariasis. Altogether, leg elephantiasis cases were detected in 3.25% in males and 5.06% in females, and hydrocele cases were noticed in 5.46% of men. A total of 357 individuals (224 males and 133 females) of the study population (6.67%) were affected with acute ADL during previous three months. During the investigation, arm elephantiasis was recorded in two

men and five women, and three females subjects had breast swelling. The prevalence of total disease attributable to filariasis among males and females was 14.79% and 10.04%, respectively with a significant difference between sexes.

Elephantiasis is more prevalent in females than the males (p<0.001), while the prevalence of ADLs is more among males than among females (p<0.01). The overall disease attributable to filariasis is more prevalent in males than in females (p<0.001) (Table 1). The age and gender specific prevalence of chronic filarial conditions (Fig 1) indicate that the prevalence of elephantiasis increased with age in both sexes and was highest in those aged > 70 years; 14.29% of males and 19.35% females aged >70 years were suffering from elephantiasis. The prevalence of hydrocele increased along with age up to age cohort of 50-59 years and slightly decreased afterwards. Hydrocele was observed in 12.06% men in the age group of 50-59 years. The age specific prevalences of ADL cases during a period of three months (Fig 2) indicate that the ADL prevalence is increasing with age until 50-59 years of age.

Table 1
Summary of clinical examination of subjects in Khurda district, Orissa.

| | Male | Female | Total |
|---|-------------|-------------|-------------|
| No. of subjects | 2,806 | 2,551 | 5,357 |
| No. of subjects with | | | |
| Elephantiasis | 69 (2.46) | 115 (4.51) | 184 (3.43) |
| Hydrocele | 115 (4.10) | - | - |
| ADL ^a | 175 (6.24) | 119 (4.66) | 294 (5.49) |
| ADL ^a +Elephantiasis | 16 (0.57) | 14 (0.55) | 30 (0.56) |
| ADL ^a +Hydrocele | 32 (1.14) | - | - |
| Elephantiasis+Hydrocele | 5 (0.18) | - | - |
| ADL ^a +Elephantiasis+Hydrocele | 1 (0.04) | - | - |
| Arm elephantiasis | 2 (0.07) | 5 (0.20) | 7 (0.13) |
| Breast swelling | - | 3 (0.12) | - |
| Total disease due to filariasis | 415 (14.79) | 256 (10.04) | 671 (12.53) |

^aDuring previous three months; Figures in parentheses indicate prevalences
 χ^2 for difference between males and females in prevalence of elephantiasis = 16.91, p<0.001; ADL=6.36, p<0.01, ADL + Elephantiasis = 0.01; p>0.05; total disease = 27.57, p<0.001.

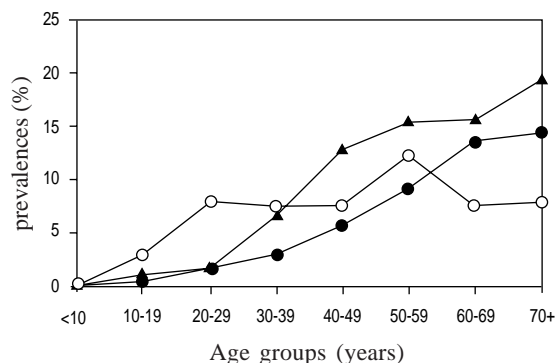


Fig 1—Age-specific prevalences of leg elephantiasis in males (●) and females (▲) and hydrocele in males (○).

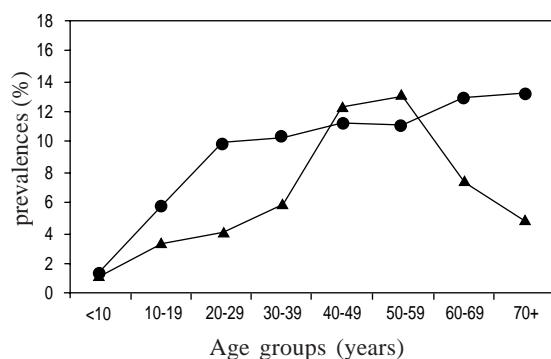


Fig 2—Age-specific prevalences of ADL cases in males (●) and females (▲).

DISCUSSION

The present results indicate that the prevalences of various forms of lymphatic filariasis are moderate to high and this disease still constitutes a major public health problem in this region of Orissa State. The data also indicate that the prevalence of chronic forms of filariasis is age dependent in both sexes. About one-seventh of men and women of higher age groups (60+) suffered from chronic debilitation forms of disease. The prevalence of ADL was also age dependant, which is not apparent in females. Women in the age group of 60+ years suffered less from ADL attacks. This could be partly due to their decreasing participation in agricultural works, with increasing age. Quite often patients report

that an attack of ADL is precipitated by hard physical work (Kumaraswami, 2000). A similar view has been reported earlier (Partono, 1987). The age dependency of chronic forms exists, probably due to accumulation of chronic cases within the population. The present age dependent trends are similar to that of the prevalences of chronic filarial conditions (Pani *et al*, 1991) and ADLs (Ramaiah *et al*, 1996), from South India and chronic condition in Varanasi, North India (Sharma *et al*, 1999).

The study also indicates differences between sexes for prevalence of various forms of filarial disease. Hydrocele was contributing to higher overall disease burden (chronic forms) in males. Among other chronic forms of disease, which are seen in both the sexes the prevalence of elephantiasis is more in females. Generally, in males, the prevalence of hydrocele was higher than that of elephantiasis (Sharma *et al*, 1987; Pani *et al*, 1991). The prevalence of total disease attributable to filariasis was significantly higher in males than in females. Pani *et al* (1991) reviewed data of 17 localities from India and indicated that the point prevalence of disease was generally lower in females than in males. They also indicated that gender dependency and preponderance of clinical manifestation was primarily due to the occurrence of hydrocele in males. This observation also reflects a relatively higher exposure of males to mosquito bites and other anatomical and hormonal differences between males and females. Gender specific physiological factors such as hormones have been suspected of affecting parasite establishment in the human host (Brabin, 1990). The present study also suggests that age and gender dependency of prevalence of various clinical forms should be considered in estimating the economic and social implications of disease filariasis.

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