MICROFILARIAL INFECTION IN EIGHT DISTRICTS OF NEPAL

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An epidemiological study for lymphatic filariasis was conducted in 8 districts of Nepal representing three geographical regions i.e. terai, mid-terai and hilly region. The overall microfilariaemia, antigenaemia and lymphatic filariasis rate were found to be 0.63%, 4.70% and 10.75% respectively. The highest crude disease and endemicity rate were found in Bhaktapur district (23.88% and 28.36% respectively), and the least in Saptari and Rautahat districts (7.69% and 1.47% respectively). Regarding age-wise prevalence, the endemicity rate of filariasis gradually increasesd with the increase in age. According to sexwise prevalence, the infection rates in both sexes were almost similar. Regarding region-wise prevalence the highest endemicity rate was found in Hilly region (24.05%) and the least in Terai region (12.54%). The sensitivity of ICT card test was found 7.5 times higher than smear test. The survey study showed that illiteracy has direct impact regarding the knowledge of filariasis. For this, awareness programs through different media can help in controlling this disease.

Keywords: Antigenaemia, microfilaria, lymphatic filariasis, *Wuchereria bancrofti,* elephantiasis, mosquito born disease.

INTRODUCTION

Lymphatic filariasis is a parasitic disease caused by nematodes inhabiting the lymphatics. It is one of the most prevalent tropical diseases. Lymphatic filariasis is a dramatically disabling, disfiguring disease usually affecting one or both limbs, causing hydrocoel and equally grotesque enlargement of male scrotum. Infection also causes acute fever, inflammation of the lymphatic system and the branchial asthmatic condition known as tropical pulmonary eosinophilia, (WHO, 1995). Other complication may include chyluria and chronic pulmonary fibrosis.

More than 15 million people suffer from filariasis, 27 million from hydrocoel, 83 million from lymphatic filarial disability and 30 million from renal pathology (WHO, 1997). Thus it is estimated that about 120 million of world population suffer from this disease (WHO, 2000). Approximately one third of people infected with this are from India, Africa, and South-east countries (WHO, 1997).

In Nepal, first work on filariasis was done by Jung (1973). More recently, Sherchand *et al.* (2002) studied mapping of lymphatic filariasis in Nepal which showed 13% of infection on the basis of 37 districts of Nepal. At present out of total population of Nepal 60% (13.9 million) are estimated at risk of filariasis. Only one sp. *Wuchereria bancrofti,* the causative agent of filariasis has been reported in Nepal (Thakur, 2000).

MATERIALS AND METHODS

A total of 958 blood samples were collected from 3 geographical regions i.e. Terai, Mid-terai and Hilly region which included 8 districts. In each district two VDCs were selected on the basis of clinical symptoms. In terai region Saptari, Siraha, Dhanusha, Mahotari and Rautahat were selected, from where 182, 55, 100, 117 and 136 samples respectively were collected. From Mid-Terai, 106 samples were collected from only one district i.e. Sindhuli. Similarly Bhaktapur and Lalitpur districts were selected from Hilly region, in which 201 and 61 human samples were collected respectively. The samples were randomly selected over a period of one year (July 2002 - June 2003). Clinical examination included examination of lymphodema of limbs, hydrocoel (in males) and breast elephantiasis (in females). Laboratory examination included thick film smear technique and serological diagnosis of filariasis by ICT card test technique.

RESULTS

A total of 958 individuals were examined from eight districts of Nepal. Of these 958 samples, 45 (4.70%) were found to be positive for filarial antigenaemia, in which two people had elephantiasis and two people had microfilariaemia. Others did not show any sign and symptom of lymphatic filariasis (LF) and microfilariaemia.

The overall crude disease rate was 103 (10.75%) in which 1 had microfilariaemia. Six people (0.63%) had microfilariaemia, without any signs and symptoms of LF and filarial antigenaemia in their blood. Hence endemicity rate was found to be 16.08% of 154 samples with age ranging from 5 years to 79 years.

The study showed that the knowledge and precaution regarding LF gradually rose with the rise in the economic status and also with the literacy rate of the people (Fig. 1). Regarding district wise endemicity rate of LF Figure 2 shows the highest rate was found in Bhaktapur (28.36%) and the least in Saptari (7.69%).

The overall study showed that the highest endemicity rate of LF was found in the age group above 70 (27.45%) and the least endemicity was found in the age group under 20 (6.54%) (Fig.3). Statistically, it was found that there was a significant difference in the endemicity rate of different age groups (χ^2=26.9, $p \leq 0.05$). Regarding crude disease rate and antigenaemia, the positive ratio of male and female were 1:14 and 27:1 respectively. Male age wise and female age wise endemicity rate is shown in Fig. 4 and 5.

Figure 1: Distribution of Knowledge and Precaution regarding LF and Literacy rate among people belonging to different Economic status

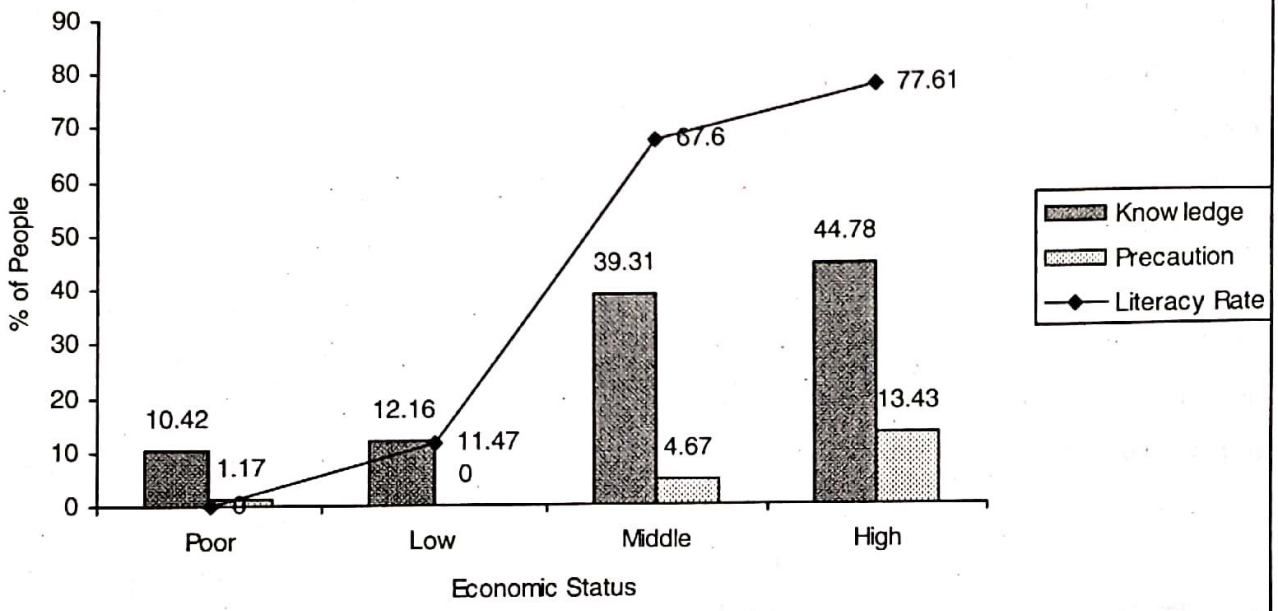


Figure 2: District-wise Endemicity rate

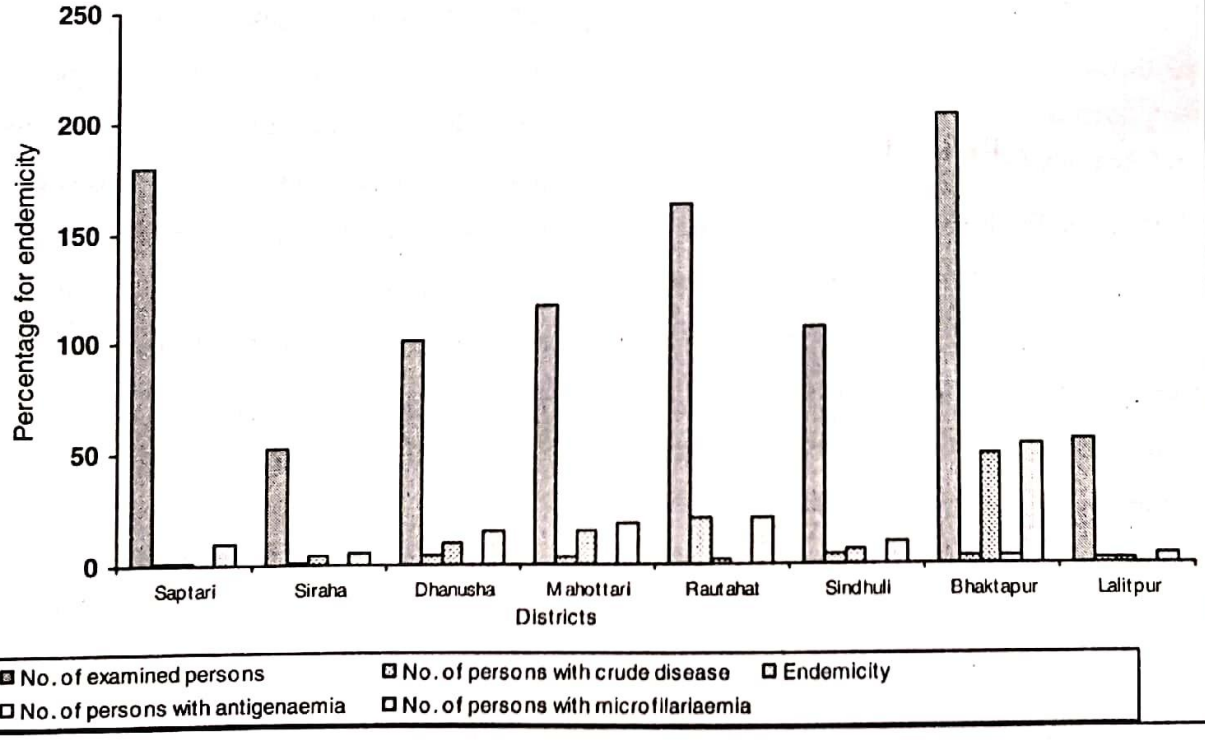


Figure 3: Age-wise Endemicity Rate

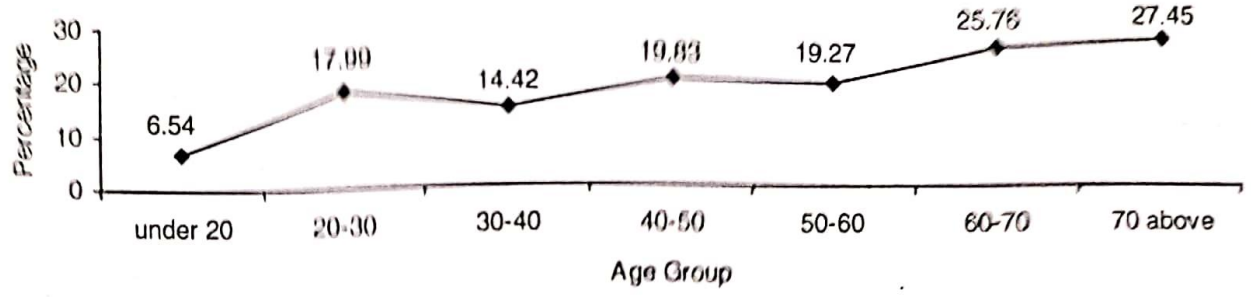


Figure 4: Age-wise Endemicity rate of LF in Males

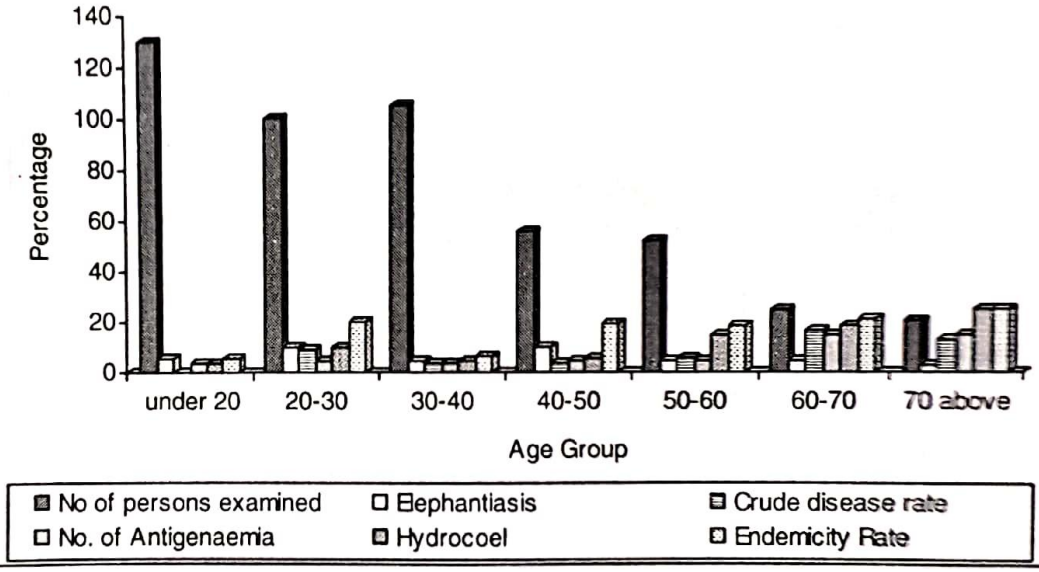


Figure 5: Age-wise Endemicity rateof MF in Females

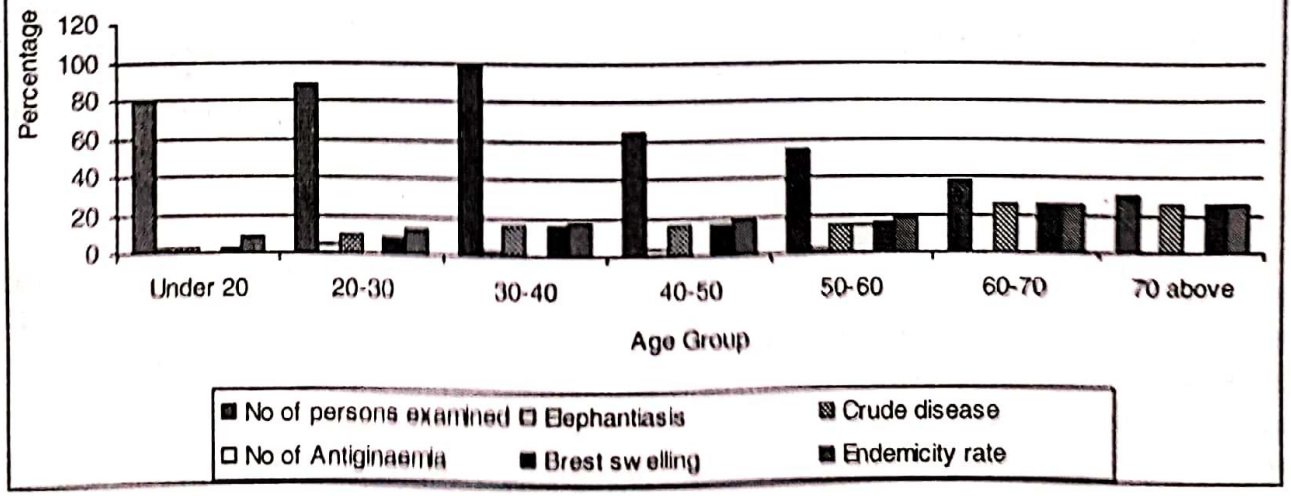
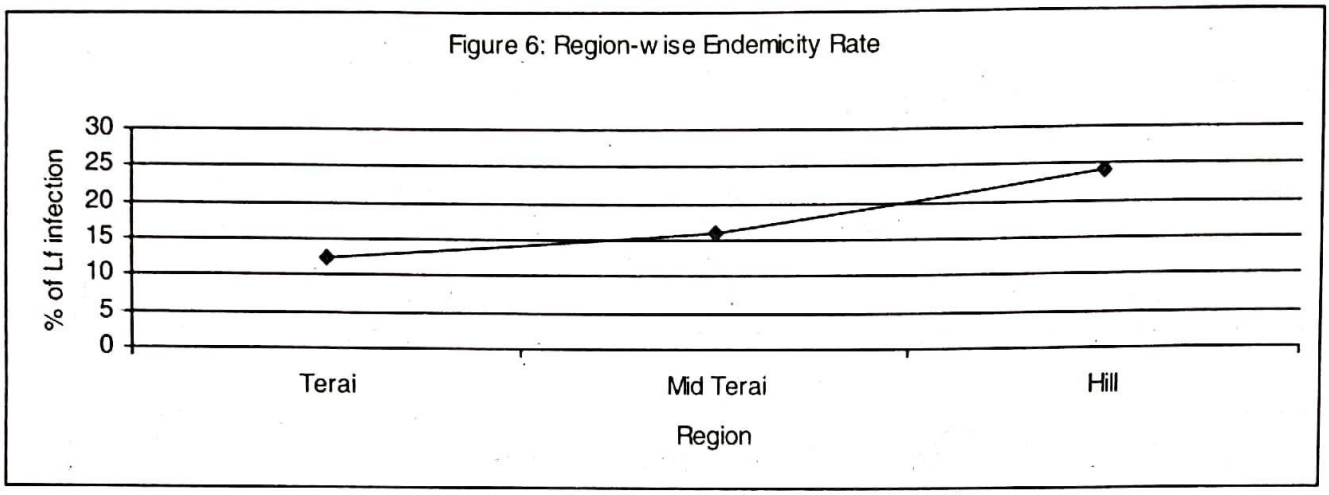
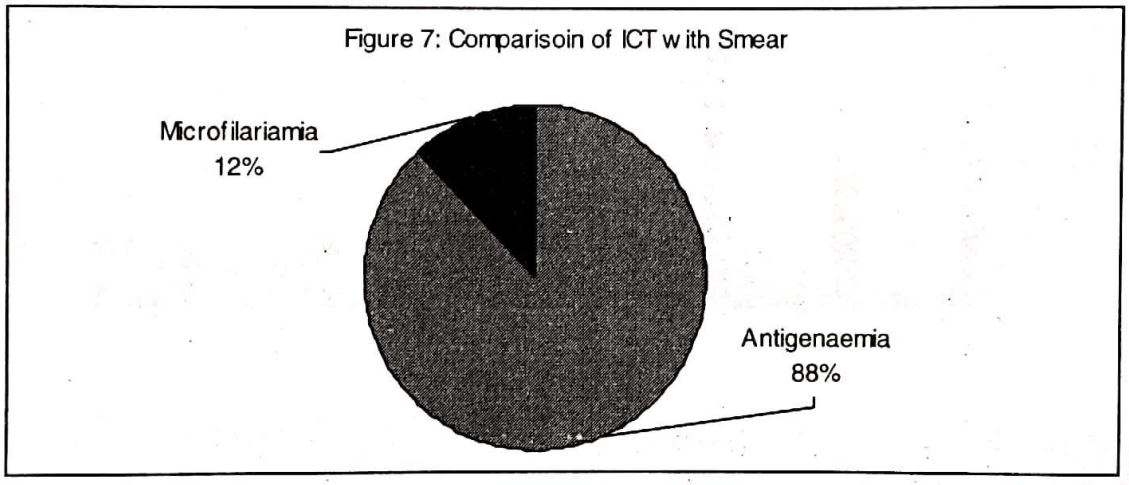


Figure 6 shows the highest endemicity rate was found in Hilly region and the least in Terai region. Statistically it was found that there was a significant difference of infection in different regions (χ^2 =17.79, $p \leq 0.05$)





ICT card test was found to be more sensitive than that of smear test as shown in Fig.7. Secondary bacterial infection was found in 52 years old women who had elephantiasis in her left leg, due to which wound appeared on the sole, giving foul smell.

DISCUSSION AND CONCLUSION

Lymphatic filariasis is a disease of poor environmental condition with low socio-economic status, low literacy rate and high percentage of illiterate health education status (WHO, 1997). The present study also showed that people of high economic status had high literacy rate and were more aware of filariasis while those of low economic status who had low literacy rate were less aware of filariasis.

From Nepal, the first report on elephantiasis was given by Jung (1973) from Central-Nepal. He reported 4.99% to 6.15% crude disease rate and 7.1% to 9.16% MF in urban population. 6.6% to 10.3% crude disease rate and 10.03% to 11.3% MF in semiurban and 1.2% to 17.8% crude disease and 0.8% to 17.69% MF in rural population. Pradhan *et al.* (1997) in Gokarna VDC of KTM valley reported 24.6% endemicity rate.

Bhusal *et al.* (2000) reported 5.8% microfilariaemia and 13% crude disease rate in Tokha-Chandeshwari

VDC. Bista *et al.* (2000) reported filariasis cases in outpatient clinics of different Health institution during FY 1995/96 to 1998/99. Manandhar (2001) reported 19.9% of crude disease from Sipwa, Dovan and Bhaktapur. Sherchand *et al.* (2002) reported 13% of microfilaria from 37 districts. In the present study the overall endemicity rate of LF of 8 districts was 16.08%. The highest endemicity rate was found in Bhaktapur (28.36%) and the least in Saptari district (7.69%). Similarly crude disease rate was found to be the highest in Bhaktapur while the least in Rautahat.

All the age groups are susceptible to filariasis. In the present study, the rate of infection (regarding antigenaemia) was found high below age 50, while the signs and symptoms of filarial disease increased with the increase in age. Age is equivalent to the length of the exposure, has also been supported by WHO (2001). According to Witt and Ottesen (2001), although LF is first acquired in childhood but clinical features occur after puberty and hence increase with ages. In the present study the highest rate of crude disease was found in 70 years and above ages. This is also supported by Bhusal *et al.* (2000). ICT card test showed that males are thrice more susceptible to MF when compared to that of females. This is supported by Weerasooriya *et al.* (2001). This may be due to the fact that in summer season, which is most optimum breeding season of mosquitoes, males usually sleep out door and are more exposed to the mosquitoes biting while females mostly sleep indoor. The females sleep with their children, so to prevent the children from mosquito bite; they use mosquito-nets and hence are unexposed to mosquitoes. Crude disease rate was found to be higher among the females than that of the males which is supported by Pradhan *et al.* (1998) and Weerasooriya *et al.* (2001).

Jung, 1973 reported that the filarial disease was more prevalent in Terai area but according to the present study the endemicity was found to be the highest in Hilly region (24.03%) and is supported by Sherchand *et al.* (2002).

The endemicity rate of filariasis from Kathmandu i.e. Hilly region given by Pradhan *et al.* (1998) and Bhusal *et al.* (2000) is 24.60% and 18.8% respectively. This is approximately same to the present study. High prevalence of filariasis in Hilly region may be due to the fact that in Terai region many mosquito-born fatal diseases remain problematic during summer and rainy seasons. So to prevent themselves from these diseases people of Terai and Mid-terai regions use vector control methods as well as chemotherapy.

In the present study the sensitivity of ICT card was found to be 7.5 times higher than that of the smear test. Similar type of result was also reported by Bhumiratna *et al.* (1999) and Sherchand *et al.* (2002).

RECOMMENDATION

The lymphatic filariasis is not much known to many people. Thus people need to be familiar with this disease. For this awareness programs through mass media, radio and television must be expanded for protecting vector born lymphatic filarial disease and to improve health and hygiene.

Concerned authority should make strict rule for introducing larvicides and insecticides or filling ditches and pits, where the depositing of water is probable during rainy season, which is suitable for breeding of mosquito. People should be made conscious to use mosquito net, mosquito coil, mosquito mat, baygon spray and ointment for protection from mosquito bite. Regular active surveillance should be carried out to know the prevalence of vector borne disease. Regular health checkup and treatment of filarial patient should also be done.

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