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Research Article

Point Prevalence of Lymphoedema among Cases of Lymphatic Filariasis in the Endemic District of Varanasi in India

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A B S T R A C T

Introduction: Lymphatic filariasis (LF) is a parasitic disease that affects millions of people worldwide. In India, LF is a priority disease for elimination; it may be neglected in some other countries. This study aimed to comprehensively analyse the prevalence, gender distribution, chronic manifestations, and age-related trends of lymphoedema and hydrocele cases reported over a four-year period.

Objective: The primary objective was to assess the prevalence of lymphoedema and hydrocele cases in this region, focusing on gender-based disparities, chronic manifestations, and age-related prevalence.

Methodology: From March 2018 to March 2022, we conducted a retrospective analysis of lymphoedema and hydrocele cases reported at the National Centre for Disease Control, Varanasi branch. Data on the total number of cases, gender distribution, and age distribution were collected and analysed using descriptive statistics.

Result: Of the 3725 lymphoedema cases reported in 4 years, the prevalence of lymphoedema was higher in males (55.2%) than females (44.8%). Chronic manifestations of this disease were observed in 66.6% and 52.7% of females and males, respectively. Age groups 31–40 and 41–50 showed the highest prevalence among patients attending the clinic.

Conclusion: Our findings show that a significant burden of lymphoedema cases of lymphatic filariasis are prevalent in the endemic district of Varanasi, and most of them are chronic and older cases where this disease is hampering the quality of life. The findings emphasise the importance of tailored interventions that consider gender, chronicity, and age-related factors in addressing the burden of lymphatic filariasis-related conditions.

Keywords: Lymphatic Filariasis, Lymphoedema, Hydrocele, Prevalence, Public Health, Gender Distribution, Intervention Strategies

Introduction

Lymphatic Filariasis (LF) is one of the preventable neglected tropical diseases, associated with various clinical manifestations, including lymphoedema, hydrocele, dermatosclerosis, elephantiasis, lymphadenitis, chyluria, lymphangitis, secondary bacterial infection, etc. Since the Global Programme for Elimination of Lymphatic Filariasis (GPELF), a significant reduction has been achieved through mass drug administration (MDA). As per a recent global estimate, 51.4 million people are infected.[1] In India, LF is a priority disease for elimination; it may be neglected in some other countries.[2] As per the 2021 estimate, 0.52 million (525440) lymphoedema and 0.14 million (144645) hydrocele cases had been recorded, and the top three high prevalence states were Bihar, Uttar Pradesh, and Odisha.[3] In Uttar Pradesh (UP), 24% of the population of this country resides, and 112 million people are at risk in 51 LF endemic districts in the eastern parts of the state.[4] Varanasi district is one of the endemic districts of UP state, consisting of around 2 million people, estimated based on the past growth rate from the 2011 census, of which around 25% of the total population lives in the slums. A study highlights the fact that poor housing patterns and construction in this district have a highly significant impact on vector density as well as disease transmission, making it more vulnerable to LF infections.

Since many socioeconomic factors have been linked to filariasis, health officials should concentrate on enhancing the standard of living in endemic villages to reduce the incidence of filariasis by using the socioeconomic index as a marker to target low- and medium-income groups for disease control programmes.[5] The identification of LF transmission risk areas in the entire country has become essential so that they can be targeted for intervention.[6] Since 2008, through MDA with two drugs (Di-ethyl Carbamazine Citrate and Albendazole), a significant reduction of LF cases has been achieved but unable to achieve elimination in the district. In connection with this fact, in 2019, MDA with three drugs (Di-ethyl Carbamazine Citrate, Albendazole, and ivermectin) was implemented in the Varanasi district.[4] The aim of the study is to determine whether the prevalence of diseases within a specific population serves as a crucial indicator for public health planning and interventions.

Materials and Methods

The study adopted a point prevalence design, aiming to assess the burden of lymphoedema and hydrocele cases of lymphatic filariasis in Varanasi district during the case-reported periods from March 2018 to March 2022. Data were collected through routine night and day clinics conducted at the National Centre for Disease Control, Varanasi branch. This centre is functioning as a regional filarial training and research centre. The majority of the cases reported as retrospective (symptomatic) at this centre were referred to us by various primary health centres, district hospitals, medical colleges, and private hospitals in the district. LF cases reported from neighbouring endemic districts were also recorded, but specific to the point prevalence of this study, they were excluded.

The day clinic provided opportunities for affected individuals to seek medical attention and diagnosis related to comorbidities of the disease. Information was collected on the total number of cases, gender, and age distribution. Descriptive statistics were used to analyse the collected data. The total number of cases was calculated, and cases were stratified by gender and age groups. Key measures such as frequencies, percentages, and means were computed to provide an overview of the prevalence of lymphoedema and hydrocele cases in the district.

Results

In the four-year period under investigation, a comprehensive assessment of reported cases revealed a total of 3725 instances of lymphoedema. Among these, a notable gender-based discrepancy was observed in lymphoedema cases. Specifically, 1837 cases of lymphoedema and 222 cases of hydrocele were reported in males, whereas 1666 cases were reported in females. Strikingly, the prevalence of these cases was consistently higher among males (55.2%) compared to females (44.8%) (Table 1). This gender-based variation underscores the complex interplay of biological, environmental, and socio-cultural factors that may contribute to the susceptibility of individuals to lymphatic filariasis-related conditions (Figure 1).

Table 1.Year-wise Prevalence of Lymphoedema Cases in Varanasi District

Year	Male (M)	Female (F)	Hydrocele (M)	Chronic Cases (M)	Chronic Cases (F)
2018–19	716	695	36	405	404
2019–20	533	515	75	328	374
2020–21	263	162	43	170	130
2021–22	325	294	68	183	202
Total (N = 3725)	1837	1666	222	1086 (52.7%)	1110 (66.6%)

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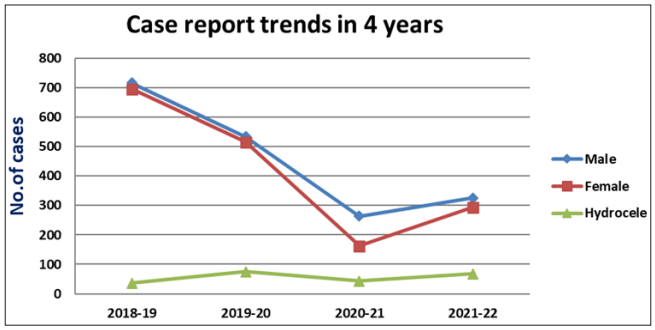

Figure 1.Lymphoedema and Hydrocele Cases of LF Trends Over the Four Years

Furthermore, an intriguing aspect of the study findings is the presence of chronic manifestations associated with the disease. Among females, a substantial 66.6% exhibited chronic manifestations, while among males, 52.7% showcased similar prolonged symptoms. This observation raises questions about the progression and management of lymphoedema and hydrocele cases, warranting further investigation into the underlying mechanisms governing the chronicity of these manifestations.

Table 2.Prevalence of Lymphoedema as per Age Groups

Age Groups (Years)	Male	Female
1-10	10	3
11-20	127	154
21-30	236	339
31-40	383	458
41-50	499	332
51-60	387	217
61-70	283	118
71-80	119	41
81-90	15	4
Total	2059	1666

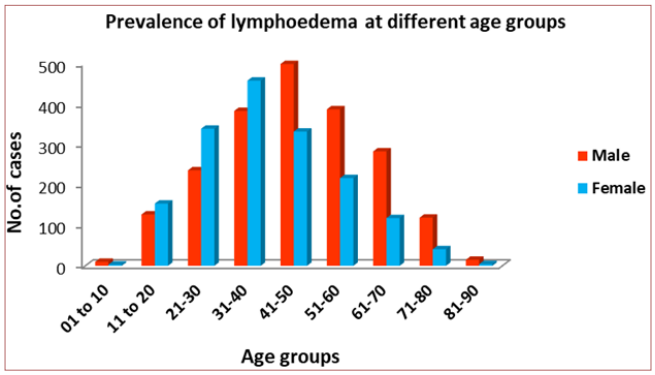

Figure 2.Prevalence of Lymphoedema at Different Age Groups in Male and Female Participants

An assessment of disease prevalence across different age groups also unveiled important insights. Notably, age groups 31–40 and 41–50 exhibited the highest prevalence of lymphoedema cases among female and male patients, respectively. This age-based trend prompts considerations about the role of cumulative exposure, immune response, and other age-related factors in shaping disease susceptibility (Table 2 and Figure 2).

Discussion

The study findings provide insights into the point prevalence of lymphoedema and hydrocele cases of lymphatic filariasis in the Varanasi district over a four-year period. This point prevalence approach offers a snapshot of the disease burden during a specific time frame. The number of acute attack episodes for an affected individual depends on sex and chronic conditions.[7] A random clinical and parasitological study at Varanasi district reveals that *Wuchereria bancrofti* infection, both microfilaria and elephantiasis, is higher in urban than rural areas, and age is generally correlated with an increase in microfilaraemia prevalence in both areas.[8] The prevalence of chronic signs is clearly age-dependent in both sexes. Examination of the gender differences in the point prevalence of LF showed a significant relationship between the occurrence of the disease and gender. The same study suggested that the failure to appreciate the importance of age and gender in disease prevalence has led to misconceptions about disease patterns in India.[9]

The observed gender-based disparity in lymphoedema and hydrocele cases resonates with previous studies that have highlighted male predominance in lymphatic filariasis-related conditions. Potential explanations for this disparity may include variations in exposure to infection vectors, differences in immune responses, and socio-economic factors. Further investigation is warranted to delve into the intricate interactions influencing gender-related susceptibility.

The identification of chronic manifestations in both males and females emphasises the need for a comprehensive approach to disease management. The differing prevalence of chronic symptoms between genders necessitates nuanced strategies that account for potential sex-specific differences in disease progression, presentation, and response to treatment. Understanding the factors contributing to chronicity could aid in tailoring interventions for improved patient outcomes.

The age-related prevalence pattern adds an additional layer of complexity to the understanding of lymphoedema and hydrocele cases. The higher prevalence in age groups 31–40 and 41–50 might be indicative of cumulative exposure over time or other age-associated vulnerabilities. This finding underscores the importance of targeting interventions not

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only at specific genders but also at different age cohorts to effectively mitigate disease burden.

Conclusion

The findings of this study underscore the multi-faceted nature of lymphoedema and hydrocele cases in the context of lymphatic filariasis. The observed gender disparity, chronic manifestations, and age-related prevalence trends provide valuable insights that have implications for public health strategies and clinical management. It is notable and the right time to conclude that, despite valid reasons, no adult vector control option has yet been brought into the elimination of lymphatic filariasis. As we are close to the elimination phase, high-risk endemic areas should step into the adult vector control option through appropriate analysis. Recognising and addressing these complexities is essential for tailored interventions that can effectively alleviate the burden of lymphatic filariasis-related conditions, improve patient outcomes, and contribute to the broader goal of disease control and elimination.

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Conflict of Interest: None

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