

Research in Lymphatic Filariasis and Newer Understanding

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ABSTRACT

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Introduction: Lymphatic filariasis (LF) is a mosquito borne parasitic disease caused by filarial worms dwelling in the lymphatic system of the human beings and is widely distributed in 81 countries in the tropics and subtropics.² This disease causes long standing disability resulting in the form of lymphoedema and elephantiasis of the limbs and genital region along with the repeated attacks of acute dermatolymphangioadenitis (ADLA).

Discussion: The original article in this issue talks for itself the importance of doing research which can contribute to better understanding of various aspect of a disease, provide new knowledge which can have a role in policy decision making applicable world over. This should be a stimulus for the younger generation to do scientific and ethical research so that we can have an evidence base for management of various diseases.

Keywords: Filarial research, Filaria control unit, ADLA, Lymphatic filariasis.

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Lymphatic filariasis (LF) is a mosquito borne parasitic disease caused by filarial worms dwelling in the lymphatic system of the human beings and is widely distributed in 81 countries in the tropics and subtropics. An estimated total of 120 million people are infected globally with LF and 1.3 billion people are estimated to be 'at risk' of developing this infection.¹ India alone contributes to about 40% of this global filariasis and also harbors 50% of the world population at risk of acquiring this disease. In India filariasis is endemic in 21 States including 6 Union territories and out of the 289 districts surveyed 257 were endemic for this disease.² This disease causes long standing disability resulting in the form of lymphedema and elephantiasis of the limbs and genital region along with the repeated attacks of acute dermatolymphangioadenitis (ADLA). The two parasite species prevalent in India are the nocturnally periodic forms of *Wuchereria bancrofti* transmitted by *Culex quinquefasciatus* constituting 98% of the disease burden and *Brugia malayi* transmitted by *Mansonia* mosquitoes causing the remaining 2%.

Based on better understanding of the pathogenesis of LF infection and subsequent disease, along with several advances in the diagnosis and management, the World Health Assembly (WHA) resolved in the year 1997, to eliminate lymphatic filariasis as a public health problem globally.³ Accordingly the World Health Organization (WHO) launched the Global Programme for

Elimination of LF (GPELF) with an aim to eliminate this disease globally by 2020. India, has set the target for elimination of filariasis by the year 2015. This programme is based on a dual approach consisting of (i) interruption of transmission to prevent the disease by mass drug administration (MDA) and (ii) alleviation of the disability in those who already have the disease.⁴

In this issue of the journal there is an original article on the research done in various aspects of lymphatic filariasis over a period of 21 years.⁵ The studies done in the Filariasis chemotherapy unit (FCU) of Government. T.D. Medical College Alappuzha have contributed to the better understanding of the disease and also helped in policy decision making in management and prevention of lymphatic filariasis.

Location of adult filarial worms in the human body was an important step in understanding of the pathogenesis of the disease. Infective stage of the filarial parasite are deposited on the skin of the host by the infected mosquito and they enter the lymphatics and grow into adult males and females. For the *W. bancrofti*, the sites preferred by the adult worms are the scrotal lymphatics in the post-pubertal boys and adult males. Other locations are the larger lymph vessels and lymph nodes draining the lower and upper extremities and breasts in females. Ultrasonography using 7.5 -10 MHz probe helps to locate the 'nests' of live adult

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worms in the above sites, during the early asymptomatic stage of filarial infection when microfilaria (mf) are usually present in the blood. The constant thrashing movement of the adult worms seen on ultrasonography is described as the 'filaria dance sign' (FDS). Studies done in FCU have demonstrated FDS in children with *B. malayi* infection in the lymph vessels of axilla, inguinal region, popliteal fossa and epitrochlear region. This has also thrown light on the subclinical lymphatic pathology in early filarial infection. It is now known that the initial pathology in early asymptomatic filarial infection is the dilation of the lymph vessels where the adult worms live and also along the length of the vessel. This has been demonstrated even in children by lymphoscintigraphy. Progression of lymphatic dilation promotes stagnation of lymph in the affected limb, which gets aggravated by acute bacterial infections of the limb, prolonged standing or strenuous exertion. Lymph stagnation facilitates the growth of bacteria that invade the affected limb following injuries like wounds or abrasions; fungal or bacterial skin infections; fissures of the skin; paronychia or eczema. Such skin lesions act as entry points for bacteria into the tissues causing the acute dermatolymphangioadenitis (ADLA) attacks and the lymphoedema gets worse after each ADLA establishing a vicious cycle leading on to elephantiasis. The most distressing aspect of disability in LF is the attacks of ADLA.

A major contribution to the scientific world by FCU is the studies on various aspects of disability management in LF. Studies have established the role of pathogenic bacteria, especially streptococci and occasionally other pathogens as the causative agents for ADLA attacks and the role of antibiotics in treatment of ADLA. It is also very clearly demonstrated that there is no role for DEC, ivermectin or albendazole in management of acute attacks.

Prevention of ADLA is most important in arresting progression of lymphoedema. 'Local-hygiene' of the affected limbs is a simple, effective, cheap and sustainable method available for prevention of these attacks associated with filarial lymphoedema. Foot care aimed at prevention of fungal and secondary bacterial infections has become the mainstay for disability alleviation in GPELF. This method requires only the ordinary facilities available for washing in any household and hence can be carried out by the patients themselves in their homes. Importance of training patients, community health workers and providers of home care in this foot hygiene programme has been

documented by these studies.

A very important aspect of LF is the comparatively new knowledge that this infection starts mostly in childhood, even though the disease manifestations are seen more often, several years later in adulthood. Studies in FCU have clearly demonstrated the presence of significant sub-clinical pathology in children, which suggest that lymphatic filariasis often has its origin in childhood. There is a tendency among parents to exclude children from mass drug administration (MDA) because of the false notion that children do not have the disease. Further research in FCU has also shown that anti-filarial drugs in doses employed in MDA reversed the subclinical lymphatic pathology in children with *Brugia malayi* infection. This finding emphasizes the importance of including children in MDA programme.

In endemic areas, regular foot-care should be encouraged from early age, in view of the fact that LF is first acquired mostly in childhood and that the early asymptomatic stage of the infection itself is associated with lymphatic damage. This would help in preventing the acute attacks and probably in arresting the development of future lymphoedema and elephantiasis in children and young adults. It is equally important that these measures aimed at prevention of disability are sustained for sufficiently long periods so that the future generation is free from elephantiasis.

The original article in this issue talks for itself the importance of doing research which can contribute to better understanding of various aspect of a disease, provide new knowledge which can have a role in policy decision making applicable world over. This should be a stimulus for the younger generation to do scientific and ethical research so that we can have an evidence base for management of various diseases.

END NOTE

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