Risk of Imported Filariasis in Pakistan

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Introduction

Human filariasis is a chronic and debilitating disease affecting over 120 million humans which causes extensive morbidity but little mortality[1]. Clinical filariasis is widespread in the developing countries of Africa, Asia and South America. In particular four species are of importance:
Onchocerca volvolus, which causes onchocerciasis (river blindness), is transmitted by the blackfly Simulium and affects approximately 18 million people, about 300,000 of whom are blind; Wuchereria bancrofti, Brugia malayi and B.tirnori, all of which cause lymphatic filariasis, are transmitted by various species of mosquitos and affect approximately 90 million people in over 76 different countries[2].Other known filarial parasites of humans are Loa loa, Acanthochièlonema ozzardi, A.perstans and A.streptocerca. Zoonotic infections may also occur from time to time e.g. Dirofilaria immitis and B.pahangi.
Adult filarial worms are vector borne, obligate extracellular parasites of their definitive hosts and belong to one of two families, the Filariidae and Onchocercidae, which comprise the superfamily Filarioidea of the phylum Nematoda[3]. In both cases microfilariae are ingested by blood-sucking vectors in which they moult twice to become infective larvae, these are transmitted to the new host when the insect bites again.
Filarial infection and in particular lymphatic filariasis has a wide spectrum of clinical disease that affects individuals of endemic regions[4]. The presentation is diverse with individuals having no clinical manifestations (asymptomatic) or microfilariae, patients being asymptomatic with microfilariae or those having bouts of filarial fevers or displaying gross lymphatic obstruction. At the extreme end of this clinical spectrum however lies the Tropical Pulmonary Eosinophilia (TPE) syndrome. This is characterized by lymphadenopathy, asthmatic bronchitis, hypereosinophilia and an increase in the production of antifilarial immunoglobin antibodies[5]. Diagnosis of filariasis is important not only for the identification of infected individuals and their subsequent treatment but also as a tool for epidemiological mapping. This topic has been comprehensively covered by Taylor and Denham in their review[6]. Since then new antigen detection techniques have been developed which do not require night blood sampling and rely on serology, making epidemiological studies much easier[7].

Disease status in Pakistan and Neighbouring countries

Lymphatic filariasis is unevenly distributed in the Southeast Asian Region but it is generally more a rural problem. Due to vastness of some of these countries and poor accessibility of many areas, coverage of filariasis surveys have been inadequate. Reports of the endemicity in many areas are hence underestimates of the actual situation. The situation in several countries including Vietnam, Laos, Cambodia, Thailand, Malaysia. Singapore. Indonesia and Philippines was reviewed by Mak[8]. This is a valuable reference as it gives a historical perspective on filarial infections in the region.
Geographically Pakistan is not surrounded by filaria endemic countries except India. China which had a filariasis problem, successfully initiated a national campaign against lymphatic filariasis in the late 1950's. Epiderniological surveillance since 1984 indicates that the transmission of infection has been interrupted using simple Diethylcarbamazine therapy and effective control has been achieved[9-11].
Lymphatic filariasis is a major health problem in India[12,13] particularly in the southern regions. A study from a Bancroftian filariasis endemic area in Pondicherry[14] discussed the infection dynamics and supported a central role for worm burden in the initiation and progressions of chronic filarial disease. Functional impairment as a result of lymphatic filariasis in Tamil Nadu, South India[15] showed that 66%

patients of filariasis confirmed that their lives had been adversely affected. Thus the economic effects and productivity loss of this disfiguring disease has been greatly underestimated.

A study in Pondicherry[16] compared the ti-end of prevalence and spectrum of manifestations of Bancroftian filariasis disease. The surveys conducted in 1957, 1986 and 1992 showed the overall prevalence of filarial disease as 4.7, 6.7 and 9.9% respectively showing that it was still a significant health problem.

The situation in Pakistan however is very different. Because of inadequate availability of information the actual prevalence of disease is not known. According to Ahmed[17], lymphatic filariasis due to W.bancrofti and B.malayi did not exist in Pakistan prior to 1947 (partition from india), except for a few isolated cases. It was however endemic in former East Pakistan presently Bangladesh[18]. Results showed a mean microfilaria infection rate of 16.8% with clinical manifestations present in 10.1% of the sampled population. The endemicity rate was 24.2%, which suggested that filariasis was a significant public health problem in Thakurgaon region, Dinajpur District, of former East Pakistan. A ten year history of infection was a prerequisite for the clinical manifestations of filariasis to become apparent. Other workers[19] also reported similar infection rates for this region and discussed the various spectra of filatial disease with relevance to urban and rural settings.

Entomological studies showed the principal vector for bancroftian filariasis is Culex pipiens fatigans[20] and there was a suggestion that the infective larvae were present in the mosquito for a specific time period, which correlated w itli optimum environmental conditions needed for transmission. This was an usual finding for a highly endemic area, according to the criteria set by Acton and Rao[21]. Pani et al[22] stated that vector infection rate may be used as an indicator for rapid assessment ol human infection.

Geographically Pakistan is not surrounded by filaria endemic areas except India. However, during mass immigration from former East Pakistan in 1974, many immigrants from endemic areas settled in urban areas of Sind particularly Karachi. Furthermore, the rapidly changing political and economic conditions in the region and the continous rural - urban drift of population to the major cities may have created a new focus of transmission. In addition Culex quinquefasciatus, the ubiquitous vector for bancroftian filariasis, is abundant in Pakistan. Southgate[23] has emphasized the importance of low-density microfilaraemia coupled with the ability of Culex spp. to transmit infection as a major risk factor for propagating filariasis.

Imported filariasis has been well documented and several studies have shown that individuals from endemic regions of filariasis pose a theoretical risk of transmission to the indigenous population. Kirsch, et al[24] showed that immigrants to Germany had microflaraemia; of the 1925 patients examined, 78(4.1%) were positive for microfilaria. The presence of W.bancrofti, B.malayi and A.perstans was confirmed. Similarly Yangco, Vincent et al[25] reported on a filariasis survey among Haitian immigrants and Southeast Asian refugees residing in Florida USA. Microfilarae were detected only in Haitians, with 6.7% positive for W.bancrofti and 1 .3% positive for Mansonella ozzardi.

Recently, Omar[26] has confirmed bancroftian filariasis among South East Asian expatriate workers in Saudia Arabia, with microtilaraemia of 3.5% among Indian male workers. He also succeeded in transmitting the infection to laboratory bred Culex pipens mosquitoes and this was the first report ever to show that local mosquitoes had the potential to act as vectors of bancroftian filariasis. Omar[26] also discussed the dangers of imported filariasis and more importantly the establishment of a self-sustained focus of disease which was likely to depend on the presence of microfilaraemic carriers and a susceptible population of vector mosquitoes.

A study of repatriated Biharis from former East Pakistan[27]. now Bangladesh, showed that in a sample of 1.101 people above one year of age. 9.0% were infected with W.bancrofti. The infection rate was significantly higher in males 10.2%, than in females 6.7%. Most importantly the mosqu toes, Cu lex pipiens fatigans collected in the vicinity of the camps were positive for infective larvae and

transmission was observed in the hottest and driest months. Thus, favorable climatic conditions coupled with a constant source of microfiariae provided the perfect conditions for filarial transmission to occur. A brief filariasis survey conducted by Wolfe and Khan[28] also highlighted the obvious dangers of imported filariasis in Pakistan and recommended that further investigations were needed.

Are we at risk?

Filariasis is one of the most enigmatic helm inthic infections of medical importance and presents a challenge to the profession. With significant migration of people in the last two decades, the foci of endemicity for filarial disease may have been modified greatly in Pakistan and therefore in this review we have attempted to highlight the need for reexamination and further study of filarial infection in the country. It would be very useful to get suitable information from hospital records which would give an approximate idea of the disease prevalence in the indigenous population.

Serological studies would be helpful in diagnosing the population actually exposed to the infection. Detailed questionnaires could be administered to the patients to assess whether infection was acquired locally or from endemic countries. We can then undertake indepth epidemiological studies, encompassing both blood surveys as well as entomological investigations to determine the exact status of filariasis in Pakistan. The dangers of imported filariasis thickly populated areas like Karachi need to be investigated to shed light on possible transmission patterns and host susceptibility to infection.

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