Introduction
Filariasis, which is synonymous to elephantiasis, is one of the oldest diseases known to mankind since 6th century B.C. It is prevalent in many parts of the tropics and sub-tropics of the world. It comprises several diseases caused by nematode parasites, of which the most common are lymphatic filariasis and onchocerciasis. The lymphatic filariasis (LF) is more prevalent of the two. Onchocerciasis occurs in about 20 million people in endemic areas of Africa, Central and South America and causes blindness in about one million. Onchocerciasis is transmitted through black flies.

LF is a mosquito borne disease. It is the major cause of disability among the tropical infectious diseases and remains unresolved major public health problem in many parts of the tropics and sub-tropics of the world. It is caused by *Wuchereria bancrofti*, *Brugia malayi* and *B. timori*. Worldwide 1100 million people are at risk and 78.6 million show microfilariae (Mf) or overt disease (Michael et al. 1996). Global estimates of LF reveals approximately 120 million people with *Wuchereria bancrofti* (90% of cases) and with *Brugia malayi* (10% of cases) are affected, with one billion people considered to be at risk of becoming infected (Michael et al. 1996). Bancroftian filariasis is prevalent throughout the tropics whereas the brugian infection is confined to certain parts of India and South East Asia. Co-existence of both brugian and bancroftian infections are reported from certain parts of India like Kerala, South India.

LI puts a tremendous strain on health care systems particularly related to financial burden in endemic areas, especially since chronic disability afflicts individuals during their most productive years. It is estimated that medical treatment for acute and chronic manifestation of the disease costs millions of dollars each year across the endemic regions. In India alone over 10 million people per year seek treatment for LF and treatment costs which includes
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people per year seek treatment for LF and treatment costs which includes expenditure on medicines, doctors fees, travel, companion costs and accommodation exceed 30 million dollars per annum. These account 32% of individual’s house hold expenses. It is also thought that the measurable health care costs of treating LF are small in proportion to the individual and societal costs from lost productivity. In addition to its economic impact, the clinical manifestations of LF impose a significant social burden on their sufferers. In such situation psychiatric counseling is often required.

In India, filariasis has been recognized as a disease of National importance because of continuous spread of the disease causing sufferings and disability. Government of India launched National Filaria Control Programme (NFCP) in 1955. With an estimated population at risk of 454 million in 261 districts and with 22.5 million individuals with filarial disease manifestations (14 million with hydrocele and 8.5 million with lymphoedema/elephantiasis). Approximately 27 million people have asymptomatic microfilaraemia (WHO, 2002). In India, LF is caused by W. bancrofti and B. malayi. While W. bancrofti is transmitted through mosquito Culex quinquefasciatus, the vector of B. malayi is Mansonia species.

Clinical manifestations of bancroftian and brugian filariasis are very similar. However there are some basic differences in manifestations caused by two filariids. Though lymphoedema and elephantiasis of legs and arms are common to both but unlike bancroftian filariasis the absence of involvement in the genito-urinary organs is a characteristic feature of malayan filariasis. In endemic area there are categories of infected subjects. a) Asymptomatic amicrofilaraemics (endemic normal) - a major portion of the population shows no mf or clinical manifestations of filarial infection. b) Mf carriers - 10% to 20% of individuals in the population show Mf in the peripheral blood but no recognizable clinical manifestations and some time they may remain as such for their whole life. c) Symptomatics -1.5% of infected individuals shows clinical manifestations with or microfilaraemia. Thus
spectral of LF shows analogous with leprosy. One pole is represented by Mf carriers with no signs and symptoms and other pole by patients with elephantiasis and chronic lesions.

Reduction of morbidity associated with the disease and interruption of transmission are the two general strategies currently being used in the control of human filariasis employing chemotherapy and vector control methods. Inspite of constant efforts to treat patient from free of infection some of the Mf carriers show reappearance of Mf after treatment with the main drug of choice for filariasis diethylcarbamazine citrate (DEC). Therefore, in view of re-infection control of LF has been a challenging problem. The main problem is with the limited understanding on aftermath of drug treatment on host-parasite relationship. Diethylcarbamazine (Hewitt et al. 1947) and Ivermectin (Campbell et al. 1983) are mainly microfilaricides with little or doubtful action on adult worms. DEC is taken by those who are infected with *W. bancrofti* whereas ivermectin is given for onchocerciasis or *Loa loa* patients concurrent with *W. bancrofti*. Inspite of repeated intake of the drug the infection is spreading very fast. Surveys carried out over the years have revealed that areas previously known to be free from filariasis show evidence of infection. These drugs are known to affect specific immune responses (Tyagi et al., 1986; Piessens et al., 1981; Haarbrink et. al., 1999) of the infected host. Despite a lot of work has been carried out on DEC its mode of action is still not completely understood. One of the handicaps in the management of filariasis by DEC is the profound immune hypo-responsiveness of the filaria-infected hosts. Immunological tolerance exists towards filarial antigens in the asymptomatic microfilaraemic carriers with decreased B-cell function (Nutman et al. 1987) and cellular responses (Piessens et al. 1980). However it has been reported that specific T-cell responsiveness can be partially recovered after treatment of microfilaraemics with DEC (Piessens et al 1981; Lammie et al., 1988b). In cross sectional studies besides microfilaraemics certain chronic cases with manifestations and endemic normals also showed T-cell unresponsiveness.
indicating presence of active infection (Yazdanbakhsh et al. 1993). Animal models with lymphatic dwelling filarial infection also showed hyporesponsiveness as evident from filarial antigen specific cells with suppressor activity during microfilaraemic stage and late stage of infection (Lammie et al. 1984). However no studies have so far been made on the analysis of genetic material in lymphocytes of filaria infected hosts before and after antifilarial treatment.

Due to long-standing nature of the infection a constant stimulation is expected to alter the host system. In animal models atrophied lymph nodes are one of the characteristic features of chronicity of the infection. All these situations raise many questions, such as, to what extent the altered immune responses of the host following treatment with antifilarials are able provide environment for development of newly acquired infection. Whether individuals become more vulnerable to acquiring infection or become resistant to re-exposure to L₃. Whether alteration in biology of parasite occur due to chemotherapy. Unfortunately, there have been no such studies pertaining to re-infection following chemotherapy. The major constraint faced towards this end has been primarily due to non-availability of suitable laboratory model, which can by and large simulate human situation.

For *W. bancrofti* there is no permissive rodent host. The other human filarial parasite *B. malayi* which is easily transmittable to rodent host and several biological, biochemical, immunological, pathological etc. similarities with the *W. bancrofti* has been used for many manipulative research. *M. coucha*, a rodent model for *B. malayi*, developed and standardized (Murthy et al. 1983) in this laboratory is not only a good laboratory model for various studies (Murthy et al. 1990, 1995; Mishra, et al. 1997), its chemotherapeutic responses to DEC and IVM (Tyagi et al., 1986;) match with those reported for humans. Besides, routinely *M. coucha-B. malayi* model is being extensively used in this laboratory for investigation of various aspects of filariasis. If the alteration in immune response of the host induced by *B.*
responses are identified with relation to re-infection then the human responses to the parasites can be identified. Under these situations studies on this aspect was thought interesting and expected that it may provide valuable information for development of effective control of the disease. In view of the above importance in this aspect, the present study was aimed at investigating the response of re-exposure to B. malayi infected M. coucha previously treated with antifilarials. The objectives of the study were as follows:

- To study the development of infective stage of the parasite to adult worms and their fecundity after re-exposure to B. malayi infected M. coucha previously treated with antifilarials.

- To investigate the specific immunological (humoral and cellular) and cytokine responses of the host after re-exposure to B. malayi infected M. coucha previously treated with antifilarials.

- Identification of filarial antigen molecule with sera of antifilarial treated host and after re-exposure to B. malayi infected M. coucha previously treated with antifilarials.

- To investigate the DNA integrity in lymph node and spleen cells of M. coucha harbouring different stages of B. malayi.