The Journal of Medical Research

Research Article

JMR 2018; 4(6): 267-273
November- December
ISSN: 2395-7565

www.medicinearticle.com
Received: 17-11-2018
Accepted: 24-12-2018

A Epidemiological Study showing Prevalence of Lymphatic Filariasis in endemic & non-endemic regions

Dr. Kamal Narain[1], Dr. Vaishali Gupta[2]

1 *Assistant Professor, Department of Medicine, Hind Institute of Medical Sciences, Mau, Ataria, Sitapur, Uttar Pradesh, India*

2 *Assistant Professor, Department of Microbiology, Hind Institute of Medical Sciences, Mau, Ataria, Sitapur, Uttar Pradesh, India*

Abstract

Introduction: Filariasis is a public health problem of considerable magnitude. It is estimated that at least 6 million attacks of acute filarial diseases occur per year and at least 15 million persons currently have one or more common filarial lesions. **Material & Method:** The present study was undertaken with the aim to assess the prevalence of filariasis in different regions of Uttar Pradesh and Union Territor of Delhi, as there is no reliable data available particularly from western parts of the said region. **Observation & Result:** Prevalence of filariasis in different regions of UP as assessed by clinical examination, MF demonstration & FST is 20.76%, 28.26% and 60.96% respectively. **Conclusion:** The disease is not fatal yet is responsible for considerable morbidity and social stigma and many avoidable surgical interventions.

Keywords: Filariasis, Filarial skin test (FST).

INTRODUCTION

Epidemiology

Geographical distribution of lymphatic filariasis has been documented [1, 2]. In filariasis it is very difficult to produce reliable data on the number of people infected with parasite or affected by disease and even more difficult to give a realistic estimate of people "at risk" of infection. Species of mosquito that transmit filariasis are found throughout tropical and subtropical areas but the endemicity are limited to those regions where conditions are favorable for transmission. These are predominantly in hot and humid regions. However, periodomestic mosquito Culex in India is capable of transmitting infection in relatively drier areas also. Within the overall endemic areas, all persons must be considered to be "at risk" of exposure to infection.

India: Filariasis is wide-spread in India and occurs in all the states except in Punjab (early traces), Himanchal Pradesh, Jammu & Kashmir and Rajasthan, all of which lie in the north western part of the country. The population at risk has been reckoned as 236 million. Since 1955 national filarial control program has been launched. Surveys have indicated the chief parasite to be W. bancrofti, periodic type. B. Malayi, periodic type, occurs in limited areas in Kerala, Orissa and Assam including Manipur. Sub periodic types do not occur in India. W. bancrofti infection is endemic in Ganges plain from Lucknow to Delata, in Assam and in an Inland area of Andhra Pradesh and Maharashtra along with courses of great rivers. In general infection is more itense in urban areas than in rural areas. The situation is not static and in many areas, especially in Uttar Pradesh and in Kerala, the infection has spread during the past 60 years which previously had been apparently free. This spread has been favored by increasing urbanization and frequent migration and travels.

***Corresponding author:**
Dr. Vaishali Gupta
Assistant Professor, Department of Microbiology, Hind Institute of Medical Sciences, Mau, Ataria, Sitapur, Uttar Pradesh, India
Tell: vishn25@gmail.com

Infection rate in different states is as follows:

	MF rates	Diseases rate
Kerala	29%	4-7%
Tamilnadu (Chingleput)	11%	8%
Andhra Pradesh (Medek)	12%	8%
Karnataka (Gulbarga)	11%	1.9%
Maharashtra (Bombay)	3.5%	0.8%
Gujrat (Bulsar) (Rajkot)	18.3%	8.8%
Madhya Pradesh (Gwalior)	2.8%	0.5%
Orissa (Cuttak)	19.1%	5.7%
Bihar (Bhagalpur)	22%	36%
West Bengal (Howdrah)	12.4-14.8%	35%
Assam (Kamrup)	2.2	0.8

MATERIAL AND METHODS

Study Population

1. Control subjects (from Kashmir area) 200

   (A known nonendemic area)

The area of study

The area of study was as follows:

Central Uttar Pradesh (Lucknow and surrounding districts)

Patients admitted to medical wards at King George's Medical College and its associate hospitals. The selection of the population was at random both for filarial related as well as asymptomatic and diseases unrelated to filariasis. Patients in this group were both from urban as well as rural areas of Lucknow and surrounding districts, viz., Sitapur, Barabanki. Sultanpur, Faizabad, Raibareilly, Unnao and Hardoi. The age group of the population ranged from 13 years to 80 years. Both male and female sexes were included. A sub group of normal healthy male student volunteers residing in a hostel of Lucknow University were also included in the study.

Eastern Uttar Pradesh (Gorakhpur and adjoining districts)

Patients and normal healthy attendants admitted to medical wards at BRD Medical College, Gorakhpur were included in this group, both urban and rural. The area is known for high endemicity for filarial infections. This part of the study was carried out with the active assistance of Prof. NBS Sarkari, Prof of Medicine at BRD medical College, Gorakhpur.

Western Uttar Pradesh and Union Territory of Delhi

Study was conducted at following places:

a. Aligarh

In this group admitted patients and their healthy attendants in Medical wards of Jawahar Lal Nehru Institute for Medical Sciences, Aligarh Muslim University, Aligarh were studied with the active support of Prof. SG Tewari, Prof of Medicine.

b. Meerut

In this group, patients admitted to medical wards at LLRM medical college, Meerut were studied with the assistance of Prof. GP Elhence, Prof. & Head of medicine.

c. Union Territory of Delhi

This part of the study was carried out with the active support of Dr. CP Singh, Head of Medicine,Safdarjung Hospital, Lucknow.

Hill Area of Uttar Pradesh (Ranikhet)

The study was conducted in a group of female students in the age group of 14-19 years residing and studying at Ranikhet a remote hill area of Uttar Pradesh. These students were transferred from Ranikhet to GM & Associated Hospital for treatment of alleged food poisoning by intake of sweets (Laddoo) at the independence day function. Later investigations revealed that they suffered from a psychiatric disorder namely "mass hysteria".

Kashmir

This non-endemic area was selected to assess the reaction patterns with filarial skin test (FST). The population in his group was selected from local rural permanent residents with no history of migrations or travel to endemic areas and having no filarial related symptoms. Only FST was performed in this group. This part of the study was carried out by Prof. HAK Durrani and his staff at the Government Medical College, Srinagar, Jammu & Kashmir.

Microfilaria demonstration

CONVENTIONAL THICK NIGHT BLOOD SMEAR

Peripheral capillary night blood for demonstration of microfilarial was taken by finger puncture method. After clearing the tip of a finger (preferably ring finger) with alcohol, it was puncture and 20U mm blood was sucked in a pipette and a thick blood smear was prepared on a clean glass slide covering an area of about half a square inch and was allowed to dry. The blood film was dehaemoglobinized and fixed with methanol. The fixed slide was them stained with Giemsa stain. The microfilarial count was made under the low power of the binocular microscope and expressed as per 20 cubic mm of blood.

Venous blood concentration technique

The venous blood from a superficial vein of the upper extremity by applying tourniquet pressure (to make the vein prominent) was collected in a 10ml disposable syringe after cleaning the area with absolute alcohol. The sample collection was done between 10:00 p.m. to 1:00 a.m. The blood was transferred to a heparinised vial and shaken gently to mix heparin and the blood.

The heparinized blood was filtered next morning using membrane filters of 5micron porocity (Millipore filters) by the technique [3]. Five ml of the blood was haemolyzed by the addition of distilled water for one minute and the tonicity of the medium was maintained by adding concentrated sodium chloride solution. It was filtered thorough Millipore filters using a suction apparatus to facilitate filtration under positive pressure

Filters were taken out from the filters holder and immersed in normal saline for 10-15 minutes at 37^0 C to loosen the attached microfilariae from the filter. The suspension was then centrifuged at 3000 rpm for 10 minutes. The separated pellet containing microfilaria was re-suspended in saline and entire content was examined under iris setting sufficient to give good contrast. The microfilare (mf) by this technique are seen live and are motile. The microfilaria count was expressed as microfilarae per 5ml of blood (mf/5ml).

For demonstration of microfilaria in blood certain factors must be kept in mind. First and foremost is the phenomenon of periodicity. The ideal collection time for different species has been suggested as follows:

Species	Collection time
W. bacrofti	
Periodic (Nocturnal)	22.00-04.00hrs
Sub-periodic (Nocturnal)	20.00-22.00hrs
Brugia Malayi	
Periodic (Nocturnal)	22.00-04.00hrs
Sub-periodic (Nocturnal)	20.00-22.00hrs
Brugia timori	
Nocturnal	22.00-04.00hrs
Loa loa	
Diurnal	10.00-15.00hrs

Even collection at appropriate time may not yield positive result because numbers of microfilariae in blood is often few and therefore larger the volume of blood greater the possibility of demonstration of microfilaria. In chronic infection microfilarial yield is very low. Microfilaria are higher in capillary than in venous blood. Similar number of W. bacrofti microfilare can be recovered from 0.1ml of ear lobe capillary blood as from one ml of venous blood [4]. Also, more microfilarial can often be found in capillary blood collected from ear lobe than from the finger.

Filarial skin Test

Recently, Central Drug Research at Lucknow has developed a skin test using B. malayi larval antigen for the diagnosis of human filariasis. It has been claimed to have a very high specificity and sensitivity in earlier reports [5].

Antigen Preparation

i. Collection of Brugia malayi infective larva:

Laboratory bred susceptible strains of Aedes aegypti female mosquitoes were feed on microfilaraemic Mastomys natalensis (rodent) between 7.30 to 8.30 pm when circulating microfilariae of subperiodic strain of Brugia Malayi (L3 stage) are in abundance in systemic circulation. The fed mosquitoes were kept for 10 to 11 days in a temperature (2^0 C) and humidity (5%) controlled in setarium for collection of infective larvae (L3 stage) the mosquitoes were dissected on 10^{th} or 11^{th} day in 0.85% sterile saline under a dissecting microscope. The 3^{rd} stage (L3) infective larvae were extracted and stored at -4 centigrade until required number of larvae were obtained. The soluble fraction was finally sterilized by filteration (0.22 U filter), using the technique described by [6]. The protein content of this fraction was determined and used as antigen as described by [7]. Merthiolate was added in the concentration of 1;10,000 (Indian Pharmacopia, 19850) as preservative.

Lyophilization

The antigen solution was distributed in several sterilized ampoules and lyophoilized by the technique described in Recent advances in Researches on Filariasis and Schistosomiasis [8]. The ampoules were sealed under vaccum at 102 Torr (Lyophilab 80C, The Scientific Instrument Company Ltd).

On the day of testing the stored lyophoilized antigen was reconstituted with the distilled water to its original volume (0.2ml) and then diluted with normal saline (0.85%) of get the required antigen protein concentration (40µg/l).

Storage

The lyophoilized antigen in vaccum sealed vials was kept at ordinary room temperature. The protein estimation of the stored antigen was made immediately before use. The skin reactivity (based on protein concentration at the time of storage) was evaluated and compared with freshly prepared antigen. The stability of the antigen have been evaluated and found to retain is biological activity as evidenced by skin reactions. There was also no alteration in the protein contents [5].

Procedure of the test

This reactions is based on the interaction between the sensitized mast cells fixed in the dermis and the homologous antigen inoculated. Antigen (0.05ml containing 2µg protein) were injected intraderamly on the volar surface of the forearm. Care was exercised not to deposit antigen in the deeper tissues and spilling of antigen on skin surface. The original wheal and that formed 15 minutes after injection of antigen were marked with a ball point pen and impression taken on butter papers moistened with Alcohol. The reaction ratio on which the present work is based on was to determined as follows as described by [6].

Reaction Ratio (RR)

Wheal area immediately after inoculation of antigen was recorded. The reaction being immediate hypersensitive type, full wheal of the antigen develops about 15 minutes after the antigen injection. The impressions recorded on butter paper as described above were transferred on a tracing paper and later translated on to mm2 graph paper. The area covered by the original wheal and that by the final wheal were determined. The reaction ratio was obtained by dividing the final wheal area with the initial wheal area. The reaction ratio of 2 and above was taken as positive reaction as this was found to be most specific and yielded least false positive, the Youden's Index being 0.9864 [9].

Statistical analysis

Data collected were cleaned, filled in the excel sheet and analyzed. Percentages and proportions were used to express data.

OBSERVATION AND RESULTS

The present study was undertaken with the aim to assess the prevalence of filariasis in different regions of Uttar Pradesh and Union Territory of Delhi, as there is no reliable data available particularly from western parts of the said region. Besides examining the nature and extent of filariasis, another major aim of the study is to determine reliability and validity of filarial skin test (FST) using Brugia malayi infective larval (L3) antigen.

The study was carryout out in a total of 720 cases. Out of these, 200 subjects were taken as control cases. The remaining 520 cases were from various parts of the Uttar Pradesh and Union Territory of Delhi. The area wise distribution of cases is as follows (Table 1).

Table 1: Area wise distribution of subjects

Study area	Place of study	No. of cases
Eastern UP	BRD medical college Gorakhpur	47
Central UP	KG Medical college Lucknow	241
Hill area of UP (Ranikhet)	GM and Associated hospitals, Lucknow	34
Western UP	JNIMS, AMU, Aligarh	48
	LLRM Medical College, Meerut	61
Union Territory of Delhi	Mental Hospital Shahdara Delhi	45
	Safdarjung Hospital New Delhi	44
	Total	520

The selection of cases was a random covering filarial related as well as other patients and healthy subjects. The subjects mainly comprised of adult age group ranging form 14-80 years. Patients of both sexes were included. The age and sex profile of the study populations is given below (Table No 2).

Table 2: Age and sex profile of study population

Area		N	Age range	Sex	
				Male	Female
Eastern UP (Gorakhpur)		47	20-62	29	18
Central UP (Lucknow)		241	14-70	130	111
Hill area (Ranikhet)		34	16-20	2	32
Western UP	(Aligarh)	48	22-56	34	14
	(Meerut)	61	18-70	58	3
Delhi		89	20-68	69	20
Total		520	14-70	322	198

FST in controls

The controls group consisted of individuals residing in rural areas around Srinagar (Jammu & Kashmir). The area is non-endemic for filarisis and mosquito vector is unable to survive at this height. Selected cases had no history of travel or migration and no filarial related signs or symptoms. The result of malayi infective larval (L3) whole body antigen are as given in Table No 3.

Table 3: Reaction of Filarial skin test in Control Subjects. (Srinagar, J&K)

No. of cases	FST positive (RR>2)	FST negative (RR<2)
200	0	200

The study population belonged to both rural and urban area. Out of a total of 520 subjects from endemic area 124 (23.84%) belonged to rural area and remaining 396 (76.15%) belonged to urban areas. The figures for microfilaria positivity and filarial skin test in rural population are given below in table No. 4. From the table it is apparent that microfilaria could be demonstrated in 36 (29.03%) subjects. FST positivity in the same group was found to be in 77(62.09%) subjects.

Table 4: Filarial endemicity as assessed by mf demonstration and FST in rural subjects.

Region	N	Mf positive cases	FST positive cases
Gorakhpur	24	4	22 (91.66%)
Lucknow	44	24 (56.54%)	35 (79.5%)
Ranikhet	0	0	0
Aligarh	10	5	8
Meerut	24	0	0
Delhi	22	3	12 (54.54%)
Total	124 (23.84%)	36 (29.03%)	77 (62.09%)

The filarial endemicity in 396 (76.15%) urban subject as assessed by microfilaria demonstration and filarial skin test (FST) is given below.

Table 5: Filarial endemicity as assessed by mf demonstration and FST in urban subjects.

Region	N	Mf positive cases	FST positive cases
Gorakhpur	23	15	17
Lucknow	197	66	137
Ranikhet	34	11	25
Aligarh	38	9	28
Meerut	37	1	3
Delhi	67	9	30
Total	386	111 (28.03%)	240 (60.60%)

From the table, it can be seen that the microfilaria could be demonstrated in 111 (28.03%) urban subjects and the same subjects showed FST positivity in 240 (60.60%) cases. On comparison, both urban and rural subjects revealed marked differerences in MF demonstration for urban (28.03%) as against for rural subject (29.93%). The same hold true for sensitivity patterns to filarial skin test too, 60.60% of urban subjects reacted positivity to FST as against 62.09% of rural subjects.

The prevalence of Filarialsis in different regions of Uttar Pradesh and Delhi was assessed on the basis of Clinical evidence of disease, microfilarial demonstration and reactivity to filarial skin test (FST). The region wise indices of the above mentioned parameters is given below (Table No. 6).

Out of a total endemic area study population of 520 cases, 108 (20.76%) cases revealed signs and symptom related to filaraisis, including 40 (7.69%) cases of prolonged pyrexia of more than 14 days duration and where routine investigations could not be reveal the cause of fever. The mf demonstration was positive in 147 (28.26%) out of a population of 520. Same number of subjects showed a positive reactions in 317 (60.96%) subjects.

Table 6: Prevalence of Filariasis as assessed by clinical examination, mf demonstration (5ml blood) and FST.

Region		N	Clinical	Mf positive	FST
Eastern UP (Gorakhpur)		47	15 (31.9%)	19 (40.4%)	39 (82.9%)
Central UP (Lucknow)		241	69 (28.6%)	19 (37.3%)	172(71.3%)
Hill area UP (Ranikhet)		34	2(5.9%)	11(32.3%)	25(71.4%)
Western UP	Aligarh	48	9(18.7%)	14(29.1%)	36(75%)
	Meerut	61	4(6.5%)	1 (1.6%)	(4.9%)
Delhi		89	9(10.1%)	12 (13.5%)	42 (47.2%)
Total		520	108 (20.7%)	147(28.2%)	317 (60.9%)

From the above table, it is apparent that clinical manifestation of filariasis are much more pronounced in areas where filarial endemicity is of long standing (Eastern UP 31.19%, Central UP 28.63%), as against in areas where filarial spread is of relativity recent times (Western UP 11.92%), Delhi 10.11%, Ranikhet 5.88%). At the same time mf demonstration rate and sensitivity to filarial skin test (FST) is nearly uniform in whole of the Uttar Pradesh, including hill areas barring the population of Meerut and Delhi where mf of demonstration is 1.63% and 13.48% respectively. The figures for FST positivity in the above mentioned two places stand at 4.9% and 47.19% respectively.

FST reaction was examined in a total of 720 cases. Out of these 200 cases belonged to a non-endemic area (Srinagar, J&K) and all cases in the group showed a reaction ratio of <2. In remaining 520 cases the survey of reaction ratio revealeated following findings, based on the different values of RR ratio (Table No. 7).

The analysis of the reaction pattern in different regions reveals a very significant finding. The long standing endemic area subjects (Eastern UP) show a larger reaction ratio. Reaction Ratio of >6 is present in 36.17% of cases in eastern Uttar Pradesh (Gorakhpur) whereas reaction ratio of >6 was present in only 5.8% cases of Lucknow and in no case of Meerut and Delhi. Another observation is almost uniform FST positivity in the range of 70-80% in whole of Uttar Pradesh except Meerut (FST positivity 4.91%). Delhi population reacted positivity with FST in only 47.19%.

Table 7: FST reactivity (RR ratio in different regions).

Regions		N	RR ratio				Total
			<2	2-4	4-6	>6	RR >2
Eastern UP (Gorakhpur		47	8 (17.02%)	10 (21.27%)	12 (25.53%)	17 (36.17%)	39 (82.97%)
Central UP (Lucknow)		241	69 (28.63%)	109 (45.22%)	49 (20.33%)	14 (5.80%)	172 (71.36%)
West UP	Meerut	61	58 (95.08%)	2 (3.27%)	1 (1.63%)	0 (0.0%)	3 (4.91%)
	Aligarh	48	12 (25%)	19 (39.58%)	14 (29.16%)	3 (6.25%)	36 (75%)
Delhi		89	47 (52.80%)	33 (37.07%)	9 (10.11%)	0.0	42 (47.52%)
Hill of UP Ranikhet		34	9 (26.47%)	15 (44.11%)	6 (17.64%)	4 (11.76%)	25 (73.52%)
Total		520	203 (39.03%)	188 (36.15%)	91 (17.5%)	38 (7.3%)	317 (60.96%)

The filarial skin test (FST) in MF positive cases from different places is depicted in the Table No.8.

Table 8: Correlation of MF positivity and FST

Region	MF positive	FST	
		Positive	Negative
Gorakhpur	19	19	0
Lucknow	90	84	6
Aligarh	14	13	1
Meerut	1	0	1
Delhi	12	9	3
Ranikhet	11	6	5
Total	147	131	16

FST is positive in all 19 MF positive cases from Gorakhpur. In Lucknow, out of a 90 MF positive cases 84 (93.33%) showed FST positive reaction out of a total 147 MF positive cases, 131 (89.11%) showed positive FST reaction. In the cases of Ranikhet area, FST was negative in 5 out of 11 MF positive cases. These patients were treated with antihelmenthics and antispasmodics. These drugs might have interfered with FST reactivity.

DISCUSSION

Filariasis is a public health problem of considerable magnitude and it is estimated that more than 2 billion peoples around the world are living in areas endemic to filariasis, out of which more than 300million peoples live in endemic zones of India which comes to about 1/6th of total global population at risk to filariasis. It is estimated that at least 6 million attacks of acute filarial diseases occur per year and at least 15 million persons currently have one or more common filarial lesions [10].

To give a concrete example an illustration epidemiological indices tabulated by filarial clinic at Barabanki, UP, under National Filaria Control Program for the year Jan-Dec, 1988 is presented below [11].

Total number of population surveyed : 3487

MF positive (blood smear method) : 98

MF Rate : 2.8%

The present study was conducted with twin aims of assessing prevalence of filariasis in different regions of Uttar Pradesh and Delhi.

The study included a total of 720 human subjects out of which 200 from a non-endemic area (Srinagar, J&K) to serve as control. The remaining 520 subjects belonged to: i) Normal health 210, ii) Patients

with other diseases 202 and iii) Filaria related subjects 108. The study was carried out at six places namely Aligarh, Delhi, Gorakhpur, Lucknow, Meerut and Ranikhet.

The present study was designed to assess the more realistic figures regarding the distribution and prevalence of filariasis in various parts of Uttar Pradesh and Delhi. Therefore, if the Millipore "at risk" the figures for microfilaremics may be about 5 times as high reported in traditional surveys.

Earlier reports of filarial survey in Uttar Pradesh have demarcated filarial infections to be endemic only in Lucknow and districts situated east to Lucknow [1]. Later surveys conducted under National Filaria control program in western Uttar Pradesh have demonstrated MF Rate <5%. In the present study, the following set of observation have been found.

Table 9: Demographic data of Filariasis

Filarial indices			**Uttar Pradesh**			
	East	Central	West Aligarh	West Meerut	Hill	Delhi
Diseases rate	31.9%	28.6%	18.7%	6.5%	5.8%	10.1%
MF rate	40.4%	37.3%	29.1%	1.6%	32.3%	13.5%
FST rate	82.9%	71.3%	75.0%	4.9%	71.4%	47.2%

For the first times, MF rate of 29.16% for Aligarh and 32.35% for Ranikhet (hill area of UP), has been demonstrated by the present study which places whole of the Uttar Pradesh in high endemicity group. A MF rate of 13.48% has been demonstrated for Delhi as well, till now considered non-endemic for filariasis. Endemicity of the filariasis on the basis of FST is even much higher in Western UP. (75% for Aligarh) and Hills of UP (71.42% for Ranikhet). The only significant area which appears to have escaped from filarial expansion, is Meerut region (4.91%). The study conclusively proves earlier suspicion that filariasis has spread for and wide in areas hither to considered non-endemic for filariasis.

Earlier reports [1, 12] have always emphasized that prevalence of filariasis in rural areas is less than in urban areas owing to the existence of better conditions for transmission of infection in later area (high population density, increased travel and migration by population, rise in slums areas and ineffective vector in the present study, Urban rural epidemiological indices are as follows:

Table 10: FST and MF Rate in Rural and Urban areas:

Area	**MF Rate**	**FST positive rate**
Rural	29.03%	62.09%
Urban	28.03%	60.6%

In the present study, as is evident from the table above, in contrast to what is reported in the literature, we have found equal endemicity in urban as well as in the rural areas of the population studied. This may be due to better technique applied to detect microfilaria and high specificity and sensitivity of skin test used in the study. another factor may be rural population. Also density of the filarial infection may have increased in the recent time.

To determine the specificity of the test, 200 subjects in area which is non-endemic and where mosquito vector is absent, served as control. The population belonged to rural areas surrounding Srinagar (J &K), and had no history of travel or migrations to others areas. The results obtained by skin test with B malayi larval antigen (L3) clearly establish the antigen as quite specific as none of the control subjects showed a positive reaction. All the 200 subjects had a reaction ratio of <2.

The results with filarial skin test using B malayi larval antigen (L3) against the above parameters are summarized below:

1. Results of FST in non-endemic control population (Srinagar, J&K), revealed that none reacted positivity to the antigen (Table no 3). Thus, there is a high index of specificity of the test.
2. Evaluation of FST positivity in MF positive cases revealed a very significant sensitivity (Table no.8) FST belong positivity in majority of the cases who were MF positive and thus harbored unequivocal evidences of Filariasis.

   The patterns of positivity of FST in MF positive cases in different regions is 75-100% except a small sub population (32 cases) of Ranikhet who were treated with anti-helmenthies which may responsible for this deviation. It has been shown in the previous studies that some drugs, notably DEC, can depress the immune response in filariasis for Up to 1 years [5]. The results of the study of 520 cases places the sensitivity of these test at 93.57% clearly indicating a good excellent sensitivity of the test.

3. The findings of previous studies and the present study in regard to validity are summarized in Table no 11. Our findings are in agreement with earlier workers.

Table 11: The validity of FST in different studies.

Chandra *et al* 1978	98.6%
Kumar *et al*, 1985	92.5%
Sircar *et al*, 1989	98.07%
Present study	93.57%

The table showing sensitivity of FST using B. malayi antigen gives fairly constant results as reported by previous workers and places the sensitivity at the 93.57%. As is clear from the table, the FST has a fairly constant reproducibility, that is validity of the test is in the order of 90-95%.

One of the most significant findings of the study relates to reactivity of individuals in different areas with FST. Reaction ratio of more than 6 was found to be present in 36.17% from the cases of Gorakhpur whereas this much reactivity was present in 5.8% of cases in Lucknow and no case in case in this group was found in Meerut and Delhi. The FST reaction ratio in given population may be an indication of the duration of endemicity of Filariasis in that area. In long standing endemic areas the reaction ratio is on higher side than in areas where the infection is of recent period. Further, the test may be used to judge the period of infection in a particular community. In this finding is being reported probably for the first time.

CONCLUSION

The study revealed following significant conclusions:

Prevalence of filariasis in different regions of UP as assessed by clinical examination, MF demonstration & FST is 20.76%, 28.26% and 60.96% respectively. All the regions of UP in contrast to present knowledge, were found to harbor filarial infection including parts of western UP (Aligarh showed mf rate of 29.16%, FST rate of 75%) and Delhi (mf rate 13.4% and FST rate 47.19%). The filarial infection was surprisingly, observed in hill areas of UP (Ranikhet) with a MF rate of 13.48% and FST rate of 71.42%. The evidence of filariasis was found to be nearly equally prevalent in both urban as well as rural areas.

Filarial skin test (FST) using B. malayi larval antigen was found to have a high index of specificity as it was negative in all the 200 control subjects of Srinagar, J & K (a non endemic area). FST with B. malayi antigen showed greater degree of reactivity (higher RR) in population of long standing endemicity (Gorakhpur) as compared to areas of Western UP, Delhi and hill areas of UP.

The above data may only represent a tip of the iceberg of the problem because the filarial survey reports are generally based on thick night blood smear and clinical manifestations which can not detect subclinical or occult filariasis.

REFERENCES

1. Hawking F, Denham DA. The distribution of human filariasis throughout the world. Part I, II & III Tropical Disease Bulletin, 1977; 73:347-373, 73:967, 74:649-679, 76:693-710 (A79).
2. Sasa M. Human filariasis, Baltimore, University Park. Press, 1976.
3. Maizels RM, *et al*. Antibody responses to human lymphatic filarial parasites. Ciba Found Symposium. 1987; 127:189-202.
4. Nath K, Kunwar KB, Kulsrestha, JK . Differential serum proteins levels in filariasis and tropical eosinophilia. Journal of Tropical Medicine & Hygiene. 1962; 65(11):289-294.
5. Kalpana Murthy P, Katiyar JC, Chandra R, George, PA, Sen AB. Inhibition of filarial skin test reaction by diethylcarbamazine therapy. Indian Journal of Medical. Research. 1978; 68:428-434.
6. Chandra R, Govila P, Chandra S, Katiyar JC, Sen AB. Wuchererial bancrofti larval antigen in diagnosis of huma filariasis by skin test. Indian Journal of Medical Research. 1974; 62:1017-1024.
7. Lowry, *et al*. Antigen specific suppressor T- lymphocyte in human lymphatic filariasis, N Engl J Med. 1982; 307:144-148.
8. Sato, *et al*. Advances in methodology for immunodiagnosis of parasitic diseases; Experimental Parasitology, 1970; 30(1):132-163.
9. Singh AK, Tyagi K, Murthy PK, Chandra R, Sircar AR. filarial skin test with Brugia malayi larval (L3) antigen. Indian Journal of Medical Research (Under Publication).
10. WHO. Technical Report Lymphatic Filariasis: The Disease & It's control. Serial. No 702; 1984,
11. Srivastava VK, *et al*. Antibody responses to TAB vaccines in human filaraisis. Indian Journal of Medical. Research, 1981.
12. Rao CK. Filariasis control in primary health Care. Journal of Common Diseases. 1982; 14(3):306-311.
13. Kumar Nair, Sarma Joseph. Reassessing the global prevalence and distribution of lymphatic filariasis; Parasitology, 1985; 112:409-28.
14. Sircar AR, Tyagi K, Murthy PK, Singh AK, Puri A, Sumati Srivastava VK, *et al*. Diagnostic potential of skin test using Brugia malayi L3 antigen in human filariasis. Transactions of the Royal Social of Tropical Medicine, (Under Publication), 1989.