

## **Urban leprosy—an appraisal from northern India**

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*Summary* From an urban leprosy programme in India details were collected from 1661 new patients in order to delineate its pattern clearly. It was revealed from this study that males aged from 20 to 29 years were the largest and commonest age-at-onset group, though no age group was immune to leprosy. The patients were largely derived from unskilled workers and belonged to the low-income strata. Urban leprosy as such appears to be a negligible problem but a threatening situation is developing because of the influx of migrants from endemic belts, a pattern seen in almost all studies of this kind. This study also draws attention to the high percentage of lepromatous or borderline-lepromatous registered in an urban situation.

### **Introduction**

The epidemiological features of leprosy are well known in the endemic areas. However, very little attention has been paid to the problem of leprosy in the northern parts of India, largely recognized as low-endemic areas. Furthermore, it is interesting to note the pattern of the disease in urban leprosy centres which register patients not only from that area but also from adjoining states. We report our assessment of the problem of urban leprosy in the northern parts of the Indian subcontinent.

### **Material and methods**

In all, 1661 new leprosy patients, attending the urban leprosy centre for over a

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period of 6 years ending March 1983, formed the subject matter for the study. The bulk of the patients were either referred to us for exclusion of leprosy, or were detected while being examined for another medical problem. Only a few reported to us with suggestive symptoms of leprosy, such as an apparent change in skin colour, numbness and tingling, recurrent inadvertent trauma or burns, bleeding or drying of the nose and alteration in facial appearance. Occasionally, redness and swelling of the skin lesions and/or fever and pain in the joints were the presenting features. Deformities of varying grades were also an indication of leprosy and are the subject of a separate paper. In each case a thorough investigation of the probable evolution of the disease was done and recorded in a protocol. In particular, emphasis was laid on the place of residence, occupation, income, age, sex and duration of disease. An age-at-onset was computed by subtracting the duration of the disease from that of the age at the time of reporting. This was difficult to ascertain since very few patients could account precisely for the onset of leprosy because of its innocuous initial clinical presentation. Nevertheless, complemented recall method was relied upon for finding out approximate age-at-onset. The patients were subjected to a set of procedures including the recording of morphological features, bacterial index, lepromin test and histopathological examination to identify their position on the leprosy spectrum.

## **Observations**

### AGE

All the age groups were affected by the disease. The number, however, was fairly sizeable in the age groups 20–29 and 30–39 years. Only 16 patients had contracted the disease before 9 years of age. Details of other age groups are given in Table 1.

### AGE-AT-ONSET

The majority (36.06%) of patients had the onset of the disease between 20 and 29 years. Only 2.58% of the cases had the onset before 9 years of age. This is depicted in Table 2. There was no statistically significant relation between age-at-onset and sex ( $\chi^2 = 10.19$ ,  $df = 6$ ,  $P > 0.05$ ).

### SEX

There were 1353 males and 308 females. The ratio being 4.3:1.

**Table 1.** Age distribution according to years

Age groups (years)	Year						Total	%
	1977	1978	1979	1980	1981	1982-83		
0-9	04	03	03	03	01	02	16	0.96
10-19	31	21	25	36	36	36	185	11.56
20-29	68	64	84	118	76	179	589	32.45
30-39	54	57	44	85	37	86	363	21.85
40-49	35	41	38	42	36	59	251	15.11
50-59	20	31	30	32	28	55	196	10.60
60-69	12	14	15	19	06	14	80	4.82
70+	06	04	05	07	08	04	34	2.05
Age not known	05	01	—	—	04	—	10	0.60
Total	235	236	244	342	232	435	1724	100.00

**Table 2.** Distribution of age-at-onset and sex

Age at onset (years)	Sex		Total
	Males	Females	
0-9	39	4	43
10-19	298	79	377
20-29	493	106	599
30-39	246	61	307
40-49	160	36	196
50-59	82	151	97
60-69	19	7	26
70+	16	0	16
Total	1353	308	1661

$\chi^2 = 10.19$ ,  $df = 6$ , not significant  
( $P > 0.05$ )

#### PLACE OF RESIDENCE

Nine hundred and twenty-five patients had come from Uttar Pradesh, 314 from Bihar, 178 from Delhi, 33 from Haryana and 15 from Punjab, and the influx of these patients has been continuous. Place of residence according to the year of their applying for treatment is depicted in Table 3. Interestingly, a relatively large number of patients were diagnosed in the course of 1979-80.

**Table 3.** State distribution of leprosy

Year	States						Total
	U.P.	Bihar	Others	Delhi	Haryana	Punjab	
1977	133	19	37	34	08	04	235
1978	129	33	35	30	08	01	236
1979	148	37	29	25	03	02	244
1980	197	80	26	30	05	04	342
1981	123	50	27	27	02	03	232
1982-83	195	95	42	32	07	01	372
Total	925	314	196	178	33	15	1661

**Table 4.** Yearly income distribution of leprosy

Year	Monthly income (in rupees)						Total
	0-100	101-200	201-300	301-400	401-500	500 & above	
1977	57	113	40	18	3	4	235
1978	53	109	39	19	11	5	236
1979	62	101	48	11	8	4	244
1980	73	115	81	33	29	11	342
1981	39	91	65	18	9	10	232
1982-83	153	72	84	30	18	15	372
Total	437	601	357	129	78	49	1661

#### INCOME

The disease was largely seen to affect the lower income group (Table 4).

#### OCCUPATION

Unskilled workers, skilled workers, housewives, farmers and unemployed people were affected in that sequence.

#### LEPROSY GROUPS

The different groups of leprosy according to the year of reporting are shown in Table 5. It is evident, that the most common group was borderline (44.25%),

**Table 5.** Year distribution of leprosy groups

Year	Groups of leprosy										
	TT	I	BT	BB	BL	LL	N	Total			
1977	65	5	27	—	26	4	32	7	52	17	235
1978	56	3	25	8	27	9	26	11	49	22	236
1979	69	16	21	8	26	9	21	11	52	15	244
1980	118	8	37	9	26	12	21	20	74	17	342
1981	50	4	42	6	25	16	19	4	51	15	232
1982-83	42	5	87	8	57	6	34	7	96	31	372
Total	400	40	239	40	187	56	153	60	369	117	1661

**Table 6.** Distribution of leprosy groups and age-at-onset

Age at onset (years)	Groups of leprosy						Total	%
	I	TT	Borderline	LL	N			
0-9	1	20	17	3	2	43	2.59	
10-19	11	108	176	66	16	377	22.70	
20-29	22	165	234	132	46	599	36.06	
30-39	5	53	154	77	18	307	18.48	
40-49	1	36	98	45	16	196	11.80	
50-59	—	11	47	31	8	97	5.84	
60+	—	6	3	9	8	26	1.57	
Not known	—	1	6	6	3	16	0.96	
Total	40	400	735	369	117	1661	100.00	

$\chi^2 = 65.507$ ,  $df = 16$ , highly significant  $P < 0.001$

followed by tuberculoid tuberculoid (24.08%), and lepromatous leprosy (22.22%). It is clear that borderline borderline and lepromatous leprosy—infec-tious—constituted 66.47% of the total cases. Neuritic and indeterminate leprosy formed only 7.04% and 2.41% of the total cases, respectively.

#### AGE-AT-ONSET AND LEPROSY GROUPS

The age-at-onset and different leprosy groups are depicted in Table 6. There was a statistically significant relationship between the age-at-onset and different leprosy groups ( $\chi^2 = 65.50$ ,  $df = 16$ ,  $P < 0.001$ ).

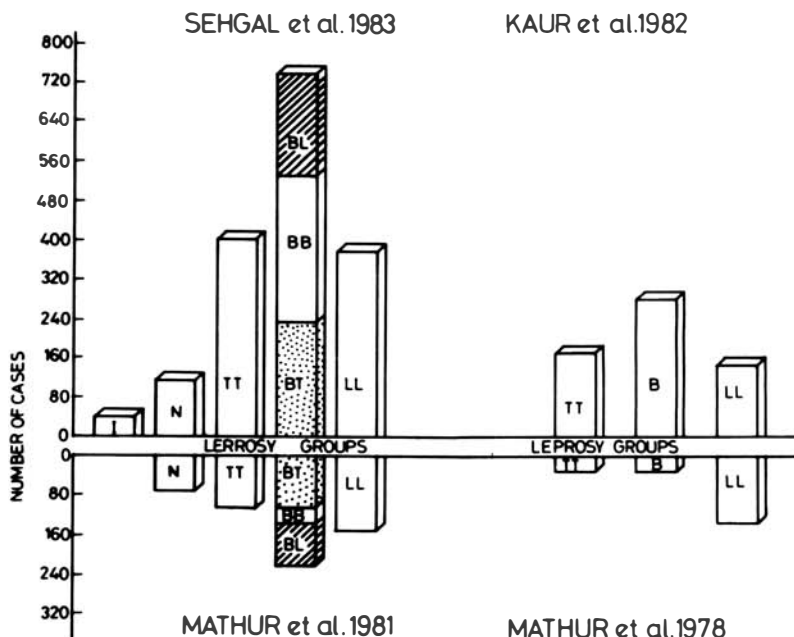


Figure 1. Comparison of leprosy groups in urban situations.

The comparative evaluation of our data with those reported earlier from Chandigarh, Jodhpur and Jaipur is shown in the accompanying diagram (Figure 1).

### Discussion

Published data on the epidemiology of leprosy are primarily based on studies from large endemic areas and it was, therefore, considered interesting to find out the endemicity of leprosy in an urban situation.

The majority of our patients were males. This is a well-known finding in studies of this nature, as confirmed by several investigators.<sup>1-8</sup> It is difficult to account for this situation. Nonetheless, it may be because of several factors like industrialization, urbanization and more opportunities for contact in males. Social customs and taboos may account for the smaller number of females reporting for treatment to a hospital. Younger patients in the age group 20-29 years were found to suffer frequently. This is in keeping with our earlier reports<sup>1,2,5</sup> and those of other workers.<sup>6-11</sup> However, this observation is in contrast to that of earlier findings.<sup>12-14</sup> It is not possible to advance an adequate reason for this age distribution, though intimate skin-to-skin contact and a variable and long incubation period may be considered.

**Table 7.** Comparison of age-at-onset from India—percent in different age groups

Age (years)	Authors					Present study
	Sehgal <sup>1</sup> Varanasi	Sehgal <i>et al</i> <sup>2</sup> Goa	Sehgal <i>et al</i> <sup>5</sup> New Delhi	Kaur <i>et al</i> <sup>8</sup> Chandigarh	Guha <i>et al</i> <sup>11</sup> Varanasi	
0-9	3.5	5.3	2.94	2.0	6.2	2.59
10-19	16.1	14.5	18.88	12.4	20.0	22.70
20-29	27.9	29.1	30.43	32.8	27.0	36.06
30-39	24.3	22.9	21.43	19.7	23.0	18.48
40-49	15.4	12.1	14.87	15.6	10.7	11.80
50 and above	12.8	16.1	8.73	17.1	13.0	7.41

Our study indicates the commonest age-at-onset to be between 20 and 29 years. The comparison of this data with the studies conducted at other urban centres like Varanasi,<sup>1, 11</sup> Goa,<sup>2, 3</sup> Punjab,<sup>10</sup> Chandigarh<sup>8</sup> and Delhi<sup>5</sup> revealed almost identical findings (Table 7). Varma & Prasad<sup>9</sup> from Lucknow reported that the majority of cases had the onset between 10 and 29 years of age, while Ali<sup>15</sup> from Chingleput found it to be equally spread between 0 and 39 years.

The distribution of patients by state showed that the majority of patients were from Uttar Pradesh and Bihar, well known for their high endemicity. It appears from our study, that leprosy as such is a small problem in Delhi itself. Certainly, this being a capital city, there is an influx of large numbers of patients from neighbouring states, who not only come for specialist treatment, but also in search of work.

The majority of cases were from a low-income group. This is a common observation. Most of those with leprosy were unskilled workers, while students and service people were those least affected. Our views are shared by Kaur *et al*.<sup>8</sup>

The large number of leprosy patients in the infectious part of the leprosy spectrum was a startling feature of our study, but not in any way different from the studies conducted in urban centres.<sup>6-8, 10</sup> Several factors, namely migration of population, industrialization and urbanization may be blamed for the present situation. Similar views were expressed by Mathur *et al*,<sup>6</sup> who attributed the increase in leprosy patients in Jodhpur to increased migration of begging leprosy patients. In the opinion of Mani & Mathew,<sup>10</sup> the increase of leprosy in Punjab may be due to a floating population of migrant labourers from Bihar and Eastern U.P., which may constitute about 10% of the population of Punjab. However, in a study from Goa<sup>3</sup> where there was hardly any migrant population, almost half of the leprosy patients belonged to the tuberculoid group, thus reaffirming our impression outlined above.

Our study indicates that urban leprosy must be taken very seriously indeed in

India, not only because of its magnitude in the cities, but also because of its implications for the further development of the National Leprosy Eradication Programme.

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