

Pattern of Leprosy in a City Hospital¹

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Leprosy, a chronic infectious disease caused by *Mycobacterium leprae*, forms the fountainhead of programs of national and international health organizations. The importance of its eradication was considerably augmented with the pronouncement of the World Health Organization's "Health for all by 2000 A.D." In India the eradication of leprosy forms a very vital component of the recently announced 20-point program. A task force has been formed, outlining the various aspects to be investigated by different research groups, and the activities of the National Leprosy Control Programme have been geared to complement the task force. Little has been done in the last 14 years to reevaluate the status of leprosy in India. Old concepts about the pattern of the disease are deeply rooted in the minds of leprologists. With this in mind, we collected data on the disease for the past five years from Delhi in an effort to clarify its present-day epidemiological status.

MATERIALS AND METHODS

In all, 1327 new leprosy cases attending our out-patient clinics from January 1977 to March 1982 formed the subject material for this study. These patients were attending the hospital for other ailments and, in the course of their assessments, were diagnosed as having leprosy. This hospital, located in the heart of Delhi, is the largest institution in North India and caters to patients from the adjoining states in large numbers.

The diagnosis of leprosy was made by

thorough clinical, histopathological, bacteriological, and immunological examination, and the patients were classified as tuberculoid (TT), borderline-tuberculoid (BT), borderline (BB), borderline-lepromatous (BL), and lepromatous (LL). In addition, we had patients with involvement only of nerves characterized by thickening and/or tenderness of peripheral nerves with no associated skin lesion and no history of skin lesions in the past. These patients were classified as having primary neuritic (N) leprosy. This group had to be included since it is a regional peculiarity of leprosy in our subcontinent (¹⁹). A few cases were included under indeterminate (I), where bizarre hypopigmented macules were located over the skin with equivocal sensory deficit and/or involvement of regional nerves.

The probable duration of the disease and the age of the patient at the time of reporting were recorded. The patient's history was corroborated through interrogation of parents, relatives, and other close associates of the patient. The age at onset was calculated by subtracting the duration of the disease from the chronological age. In each case, the history included details of occupation and monthly income. An endeavor was made to know whether the patient belonged to the Union Territory of Delhi or had migrated from an adjoining state. In the latter case, the place of birth and length of stay in the particular town were recorded.

RESULTS

The distribution of patients according to sex is shown in Table 1. The majority of patients (82.06%) were males; 17.94% were females. The yearly distribution of the cases according to age is depicted in Figure 1. The majority of the patients were between 20–29 years of age, followed by those between 30–39 years old. The disease was uncommon below ten years of age, and very few cases were above 70 years old.

Figure 2 shows the distribution of cases by state. The bulk of the cases were from

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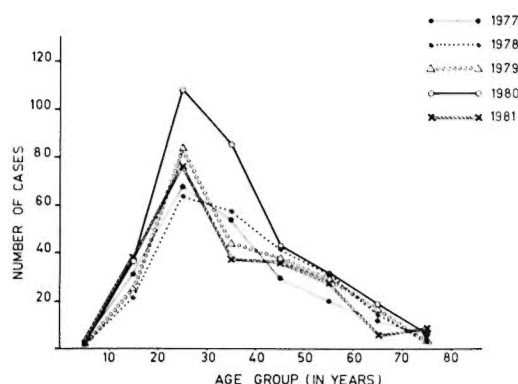


FIG. 1. Yearly distribution of cases according to age.

the neighboring areas of Uttar Pradesh (U.P.) and Bihar, with few cases from Haryana and Punjab. Delhi, itself, harbors only a few cases.

The distribution of cases according to occupation is depicted in Figure 3. A large number of patients were unskilled workers, sizeable numbers were skilled workers, but very few were students.

The distribution of cases by income is illustrated in Figure 4. The majority of patients belonged to the low income group.

The distribution of cases according to sex and age at onset is shown in Table 2. The mean \pm S.D. age at onset for males was 34.6 ± 14.8 years and for females, 32.7 ± 15.6 . These differences were not statistically significant.

The distribution of patients according to age at onset and classification of disease is shown in Figure 5. The majority of the cases (58.9%) were between 10–30 years of age at the onset of the disease. By chi-square anal-

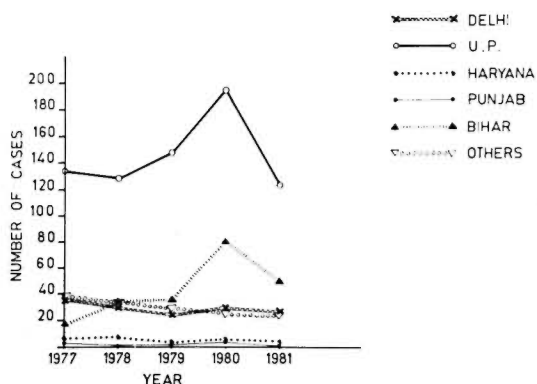


FIG. 2. Yearly distribution of cases by state.

TABLE 1. Distribution of cases according to sex.

Year	Sex				Total
	Male	%	Female	%	
1977	196	83.4	39	16.6	235
1978	196	83.1	40	16.9	236
1979	191	78.7	53	21.3	244
1980	283	82.1	59	17.9	342
1981	193	83.1	39	16.9	232
1982 (until 31 March)	30	78.9	8	21.1	38
Total	1089		238		1327

ysis, the distribution of cases by age at onset was not random among TT ($p < 0.001$), indeterminate ($p < 0.05$), borderline ($p < 0.001$), or neuritic ($p < 0.05$) patients. In LL cases the differences were not statistically significant.

Figure 6 shows the number of cases belonging to each classification of the disease. There was a marked preponderance of BT, BB, BL (41.6%) and tuberculoid patients; while lepromatous, neuritic, and indeterminate patients were comparatively fewer in number.

DISCUSSION

The majority of the patients in this study were males. The predominance of male leprosy patients is a common observation. Industrialization, urbanization, and more opportunities for contact with open cases may have some influence on the sex prevalence.

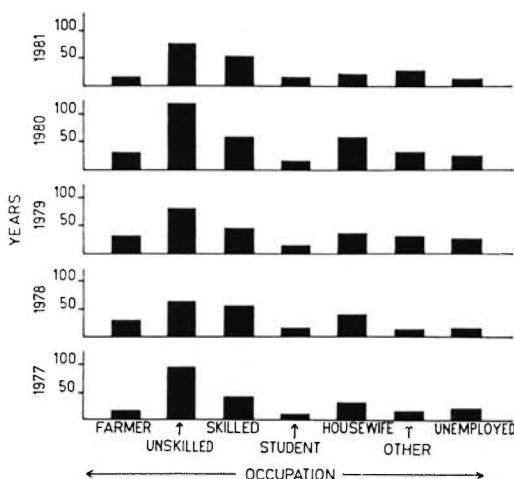


FIG. 3. Yearly distribution of cases by occupation.

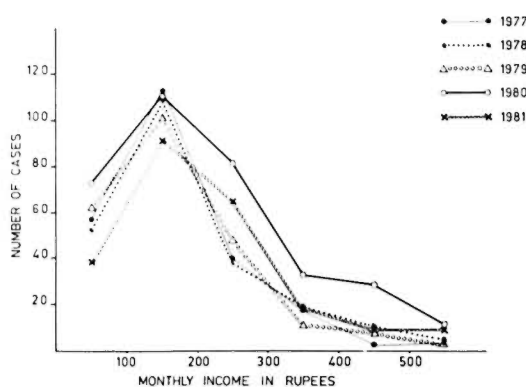


FIG. 4. Distribution of cases by income.

Social customs and taboos may also account for the fewer number of female patients reporting to a hospital (¹⁸).

The distribution of cases by state showed that the majority of the patients were from Uttar Pradesh and Bihar, both known for their high endemicity. Only a few cases were from Haryana, Punjab, and Delhi, areas of low endemicity (¹⁸). A striking increase in cases during 1980 in the Union Territory of Delhi is explained by the fact that in that year there was a substantial influx of laborers because of increased construction activities for the Asian games.

A majority of the cases was from the low income group. Although raising the economic standard of the general population is not a specific antileprosy measure, it is well known that control of leprosy in any country has always been associated with a rise in its socioeconomic standard (⁶). Most of the cases were between 20–29 years of age, indicating that adults are more frequently affected than children. Similar observations

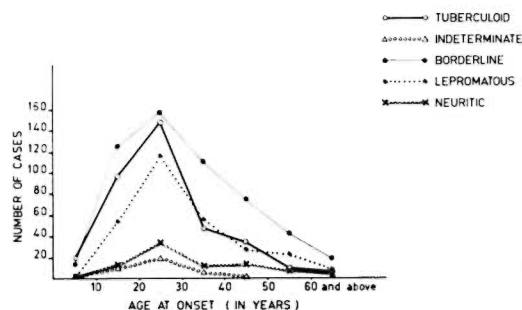


FIG. 5. Distribution of cases by age at onset and classification of disease.

TABLE 2. Distribution of cases according to sex and age at onset.

Age at onset (yrs)	Sex				Total	
	Male	%	Female	%	No.	%
0-9	37	3.4	4	1.7	41	3.2
10-19	245	22.5	57	24.0	302	22.8
20-29	399	36.6	81	34.0	480	36.2
30-39	187	17.2	44	18.5	231	17.4
40-49	116	10.7	35	14.7	151	11.3
50-59	72	6.6	10	4.2	82	6.1
60-69	24	2.2	5	2.1	29	2.2
70+	9	0.8	2	0.8	11	0.8
Total	1089		238		1327	

have been reported from Lucknow (²¹), Varanasi (^{7, 17}), Goa (²⁰) and, recently, from New Delhi (¹⁹). Our finding is in striking contrast to those of earlier workers (^{3, 15, 16}). This study is compatible with a prolonged and intimate skin-to-skin contact being an important determinant in transmission.

In the majority of the cases, the age at onset was between 20–29 years. No statistically significant differences were found between the sexes as to age at onset. On the other hand, the distribution of cases by age at onset was not random in all the leprosy types except LL. This observation suggests that the type of leprosy may influence the age at onset. Studies from Varanasi (^{7, 17}) and Goa (²⁰) revealed the age at onset to be

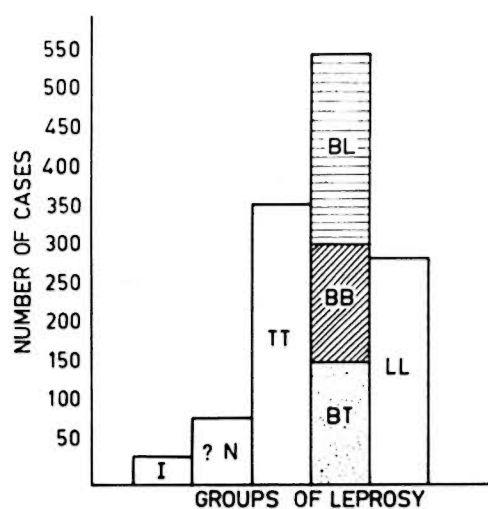


FIG. 6. Distribution of cases by classification of disease.

TABLE 3. Comparison of age at onset from India as percent of total cases in different age groups.

Age (yrs)	Ali (¹) (1964) Chingleput	Verma & Prasad (²¹) (1967) Lucknow	Sehgal (¹⁷) (1970) Varanasi	Sehgal, et al. (²⁰) (1976) Goa	Guha, et al. (⁷) (1979) Varanasi	Sehgal, et al. (¹⁹) (1982) New Delhi	Present study
0-9	15.9	5.6	3.5	5.3	6.2	2.94	3.2
10-19	19.57	23.2	16.1	14.5	20.0	18.88	22.8
20-29	23.42	30.0	27.9	29.1	27.0	30.43	36.2
30-39	18.39	18.4	24.3	22.9	23.0	21.43	17.4
40-49	12.96	13.6	15.4	12.1	10.7	14.87	11.3
50+	10.47	9.2	12.8	16.1	13.0	8.73	9.1

between 20-39 years. Verma and Prasad (²¹) from Lucknow reported that the majority of leprosy cases had onset between 10-29 years, while Ali (¹) from Chingleput found it to be equally spread between 0-39 years. These studies suggest that the age of onset differs from place to place in the same country (Table 3) and at different times in the same place (^{1, 3}). Age at onset, as reported by various workers from different countries, has also shown considerable variation (^{8, 9, 10, 14}), thus reiterating the most prudent observation of Badger (²).

An interesting feature of our study is the preponderance of infectious over noninfectious cases, thus complementing similar observations in studies of patients attending city hospitals (^{11, 12, 13}). These observations are in contrast to those of standard textbooks (^{5, 18}). It is, therefore, imperative to emphasize that leprosy may pose a public health problem in low endemic areas which is often aggravated by migration of population for various reasons. Hence, it warrants a uniform applicability of National Leprosy Control Programmes in low as well as high endemic areas to keep a check on the problem.

Neuritic leprosy, a regional peculiarity of our subcontinent, should form a component part of the leprosy spectrum. It is, however, important to establish its diagnosis through microscopic pathology.

SUMMARY

A total of 1327 leprosy patients attending one of the leading Delhi hospitals from 1977 to 1982 were reviewed. Leprosy, as such, is not a prominent disease in Delhi, but an influx of patients from the adjoining endemic states of Uttar Pradesh and Bihar has

created a challenge because of increased construction activities for the Asiad '82. A relatively large number of patients were recorded during 1980. Most of the patients were unskilled workers. The usual preponderance of males over females was fairly explicit. Patients of low socioeconomic status were seen more frequently than those of higher socioeconomic status. The disease was found in the age group of 20-30 years and, in most cases, the age at onset was between 20-29 years. Infectious cases belonging to the borderline-to-lepromatous (BB-BL-LL) groups were reported more frequently than tuberculoid (TT-BT) cases. A suggestion is made to incorporate neuritic and indeterminate cases in the five-group classification in order to cover the total spectrum of the disease.

RESUMEN

De 1977 a 1982, se revisaron 1327 pacientes con lepra de un hospital en Delhi. La lepra, como tal, no es una enfermedad prominente en Delhi, pero el incremento en las actividades de construcción para la "Asiada del 82," ha creado un problema epidemiológico por el influjo de pacientes de los estados vecinos de Uttar Pradesh y Bihar en donde la lepra es endémica. En 1980 se registró un número de pacientes relativamente grande. La mayoría de los pacientes eran trabajadores inexpertos. El predominio usual de hombres sobre mujeres fue claramente explícito. Fueron más frecuentes los pacientes de un bajo estatus socioeconómico que aquellos de estatus socioeconómicos más elevados. La enfermedad se encontró en el grupo de edad de 20 a 30 años y, en la mayoría de los casos, la edad de aparición de la misma estuvo entre 20 y 29 años. Los casos infecciosos de los grupos intermedio a lepromatoso (BB-BL-LL) fueron más frecuentes que los casos tuberculosos (TT-BT). Se sugiere incorporar los casos neurítico e indeterminado en la clasificación de 5 grupos con objeto de cubrir la totalidad del espectro de la enfermedad.

RÉSUMÉ

On a passé en revue le dossier de 1327 malades de la lèpre, ayant fréquenté les principaux hôpitaux de Delhi de 1977 à 1982. La lèpre comme telle n'est pas une maladie d'une importance prédominante à Delhi. Néanmoins, l'afflux de malades provenant des états endémiques adjacents de l'Uttar Pradesh et du Bihar, a créé un problème, par suite de l'accroissement des activités dans le secteur de la construction, en rapport avec l'organisation des Jeux Olympiques Asiatiques de 1982.

Un nombre relativement important de malades ont été enregistré au cours de 1980. La plupart de ces malades étaient des travailleurs non-qualifiés. La prépondérance habituelle des hommes par rapport aux femmes était à cet égard fort claire. Les malades d'un niveau socio-économique faible étaient plus fréquents que ceux d'un niveau socio-économique plus élevé. La maladie a été observée dans le groupe d'âge de 20 à 30 ans et, dans la plupart des cas, l'âge d'apparition se situait entre 20 et 29 ans. On a enregistré une fréquence plus grande de cas infectieux appartenant aux groupes borderline-lépromateux (BB-BL-LL) que de cas tuberculeux (TT-BT). On suggère d'incorporer les cas névritiques et indéterminés dans la classification en cinq groupes, afin de couvrir l'entièreté du spectre de la maladie.

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