

The Age of Onset of Leprosy^{1,2}

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The study of the age of onset in leprosy is interesting for regional variations characterize the disease. The studies thus far conducted in some parts of the world confirm this observation (1, 3, 6, 15). There has been a general impression that leprosy is contracted at an early age, although the reports on this aspect are largely conflicting (2). Furthermore, very little information is available about the age of onset in different clinical patterns of the disease. It was therefore decided to determine this aspect in different clinical variables and sex in a large number of leprosy patients.

METHODS AND SUBJECTS

All leprosy patients referred to or attending the Leprosy Urban Center, National Leprosy Control Program between 1969 and 1975 were investigated. In addition to the cardinal clinical features of leprosy, the diagnosis was established by bacteriologic and histopathologic examination. The patients were classified according to the Indian Leprologists' Scheme Modified (6). In order to find out the age of onset of leprosy, the patients were carefully interrogated for the earlier appearance of symptoms and signs of leprosy according to a questionnaire prepared for this purpose. The patients were given adequate time to precisely recall the symptoms (recall method). In children, in particular, the assistance of the guardian(s) was required.

RESULTS

Of the 1,053 patients, there were 675 males and 378 females. The lowest age of onset was 4 years and the highest was 72 years, the majority falling between 20-39 (52%) in both males and females. The mean

age of onset was 33.4 years in males and 32.1 in females. There was no significant difference in the sex and age of onset ($X^2 = 18.40$, $df = 7$; $p > 0.05$).

The age of onset in different clinical types of leprosy is presented in Figure 1. This also shows a peak age of onset between 20 and 40 years. The mean age of onset in different types of leprosy is shown in Table 1. It is lowest in tuberculoid and highest in neuritic leprosy, the other types falling in between. This variation of age in different types of leprosy is statistically significant ($X^2 = 38.377$; $df = 15$; $p < 0.01$).

The distribution of age of onset and clinical type of leprosy in males and females are shown in Tables 2 and 3 respectively. Generally the pattern of distribution of age of onset in different types is maintained when the sex and clinical types are taken into account together. Here again the findings are significant in males ($X^2 = 60.99$; $df = 15$;

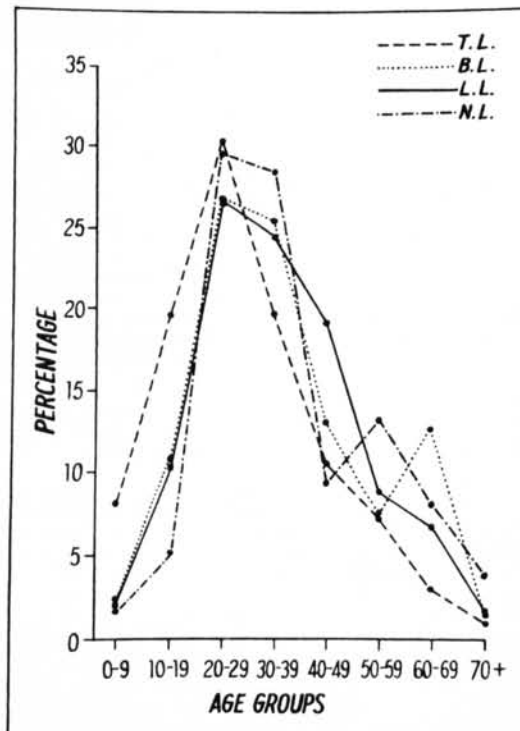


FIG. 1. Age at onset in different types of leprosy.

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TABLE 1. Mean age and standard deviation in clinical types of leprosy.

Mean S.D.	TL	BL	NL	LL	Total
	29.31 ±15.2	36.9 ±16.4	44.7 ±17.9	35.9 ±14.8	32.95 ±16.0

TABLE 2. Distribution of leprosy according to disease classification and age of onset in males.

Age group	TL		BL		NL		LL		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
0-9 ^a	25	8.4	2	1.3	1	0.8	—	—	28	4.2
10-19	56	18.3	16	10.5	6	5.0	11	10.5	89	13.2
20-29	88	29.5	43	28.1	43	36.1	26	24.8	200	29.6
30-39	71	23.8	42	27.5	36	30.3	26	24.8	175	25.9
40-49	30	10.1	15	9.8	11	9.2	22	20.9	78	11.6
50-59	16	5.4	14	9.1	10	8.4	10	9.5	50	7.4
60-69	8	2.7	19	12.4	9	7.6	8	7.6	44	6.5
70+ ^a	4	1.0	2	1.3	3	2.6	2	1.9	11	1.6
Total	298	100.0	153	100.0	119	100.0	105	100.0	675	100.0
Mean	29.3		36.8		36.0		36.5		33.4	
S.D.	±14.7		±16.0		±14.6		±14.7		±15.4	
Under 10	25	8.4	2	1.3	1	0.8	—	—	28	0.4
Under 20	81	27.2	18	11.8	7	5.9	11	10.5	117	17.3
Over 10	273	91.6	151	98.7	118	99.1	105	100.0	647	95.9
Over 20	217	72.8	135	88.2	112	94.1	94	89.5	558	82.7
Over 40	58	19.5	50	32.7	33	27.7	42	40.0	183	27.1
Over 50	28	9.4	35	22.9	22	18.4	20	19.0	105	15.6

^a Pooled for computation of chi-square.

TABLE 3. Distribution of leprosy according to disease classification and age of onset in females.

Age group	TL		BL		NL		LL		Total	
	No.	%	No.	%	No.	%	No.	%	No.	%
0-9 ^a	20	8.2	3	5.0	2	5.1	3	10.0	28	7.5
10-19	52	20.9	7	11.7	2	5.1	3	10.0	64	16.9
20-29	78	31.3	14	23.4	4	10.3	10	33.3	106	28.0
30-39	38	15.3	12	20.0	9	23.0	7	23.3	66	17.5
40-49	28	11.3	13	21.6	4	10.3	4	13.3	49	13.0
50-59	24	9.6	2	3.3	11	28.2	2	6.7	39	10.3
60-69	8	3.2	8	13.3	4	10.3	1	3.4	21	5.5
70+ ^a	1	0.4	1	1.7	3	7.7	—	—	5	1.3
Total	249	100.0	100	60.0	39	100.0	30	100.0	378	100.0
Mean	29.5		36.3		44.2		30.3		32.1	
S.D.	±15.5		±17.1		±18.2		±14.5		±16.7	
Under 10	20	8.0	3	5.0	2	5.1	3	10.0	28	7.4
Under 20	72	28.9	10	16.7	4	10.3	6	20.0	92	24.3
Over 10	229	91.1	57	95.0	37	94.9	27	90.0	350	92.6
Over 20	177	71.1	50	83.3	35	89.7	24	80.0	286	75.7
Over 40	61	24.5	24	40.0	22	56.4	7	23.3	144	30.2
Over 50	33	13.3	11	18.3	18	46.1	3	10.0	65	17.2

^a Pooled for computation of chi-square.

TABLE 4. Comparison of age of onset from India—percent in different age groups.

Age	Authors			
	Goa Present series (1976)	Mohamed Ali ⁽¹¹⁾ Chingleput (1964)	Verma & Prasad ⁽¹⁶⁾ Lucknow (1967)	Sehgal ⁽¹⁴⁾ Varanasi (1970)
0-9	5.3	15.9	5.6	3.5
10-19	14.5	19.57	23.2	16.1
20-29	29.1	23.42	30.0	27.9
30-39	22.9	18.39	18.4	24.3
40-49	12.1	12.96	13.6	15.4
50+	16.1	10.47	9.2	12.8

$p < 0.01$) and females ($X^2 = 50.002$; $df = 15$; $p < 0.01$). In neuritic leprosy, however, the mean age of onset in females is 44.2 years; much higher than the age groups.

DISCUSSION

It can be noted from this study that leprosy occurs at any age, but in the majority of patients the age of onset was between 20 and 39 years. The mean age of onset in the series was 32.95 years. No significant difference in the mean age of onset was noted when the cases were divided by sex, thus showing that sex has no influence on the age of onset. When the cases were classified according to the type of leprosy there was a significant variation in the age of onset of leprosy. The tuberculoid type of leprosy was contracted by the patients at a much earlier age than the other types. In borderline and lepromatous leprosy the mean age of onset was almost similar, while in the neuritic type it was much later. This observation suggests that the type of leprosy influences the age of onset.

When the present study was compared with other similar studies from India (Table 4), some interesting findings were noted. Studies from Goa and Varanasi go hand in hand as far as the age of onset is concerned, the majority falling between 20 and 39 years. The Lucknow study showed a shift towards younger patients, the majority falling between 10 and 29 years, while in the Chingleput study the cases were spread equally between 0 and 39 years, indicating that the age of onset differs from place to place in the same country. In an earlier study⁽¹⁴⁾ similar observations were made. In addition it was noted that the age of onset showed variations when the results of the study conducted at different times in the endemic area of Chingleput were compared^(5,11). Likewise, variations in the age of onset of leprosy are clear cut when the comparison of these is made from different countries (Table 5). Hence our observations substantiate the views expressed by Badger⁽²⁾.

Our study has also indicated that adults are more frequently affected than children.

TABLE 5. Comparison of percentage of age of onset from different countries.

Age	China	Malaita	Estonia	Philippine Islands	Rangoon	Endemic states in Continental United States	Goa
	Max-well ⁽¹⁰⁾ (1937)	Innes ⁽⁸⁾ (1938)	Parmakson (1938)	Guinto & Rodriguez ⁽⁷⁾ (1941)	Lewis & Edwards ⁽⁹⁾ (1958)	Badger (1964)	Sehgal <i>et al</i> (1976)
0-9	5.3	5.7	4.4	16.3	11.5	3.7	5.3
10-19	35.1	30.4	11.8	48.3	35.8	18.5	14.5
20-29	28.8	42.6	15.1	18.3	26.4	25.7	29.1
Over 30	30.5	21.0	68.5	16.8	26.1	51.9	51.1
0-9	5.3	5.7	4.4	16.3	11.5	3.7	5.3
0-19	40.5	36.2	16.2	64.8	47.4	22.3	19.8
Over 20	59.4	63.7	83.7	35.0	52.5	77.6	80.2
Over 30	30.5	20.8	68.5	16.8	26.1	51.9	51.1

Similar observations have been made at Varanasi (14) and Lucknow (16). This is contrary to the belief held by earlier workers (4, 12, 13). Instead, it seems that age at infection is dependent on intimacy of contact rather than greater susceptibility to the disease at any particular age group.

SUMMARY

The age of onset was determined in 1,053 consecutive patients having different types of leprosy. There were 675 males and 378 females. The majority had onset of the disease between ages 20 and 39, although all age groups were affected. The age of onset was significantly related to the type of leprosy; the mean was lowest in tuberculoid, highest in neuritic, while in borderline and lepromatous it was in between. The comparison of reports of the age of onset from India and elsewhere suggest that this varies in different regions within the country, and from country to country.

RESUMEN

Se determinó la edad de aparición de la lepra en 1,053 pacientes afectados por diferentes formas de la enfermedad. Se estudiaron 675 hombres y 378 mujeres. En la mayoría, la enfermedad apareció por primera vez entre los 20 y los 39 años, aunque hubo casos en todos los grupos de edades. La edad de aparición de la enfermedad estuvo relacionada de manera significativa con el tipo de lepra; el valor de la media fue más bajo en los casos tuberculoides, más alto en la forma neurítica e intermedio en los tipos intermedio y lepromatoso. Comparando los resultados publicados en la India con los de otros países sobre la edad de aparición de la lepra, se observó que ésta varía en diferentes regiones de un país y que también varía de país a país.

RÉSUMÉ

Chez 1.053 malades successifs présentant différents types de lèpre, on a déterminé l'âge de l'apparition de la maladie. L'échantillon étudié comprenait 675 sujets de sexe masculin et 378 sujets de sexe féminin. La majorité avait présenté les premières manifestations de la maladie entre l'âge de 20 et 39 ans, quoique tous les groupes d'âge aient été affectés dans une certaine mesure. L'âge de l'éclosion de la maladie est liée de façon significative au type de la lèpre. La

moyenne d'âge était plus basse dans la lèpre tuberculoides, plus élevée dans les cas névritiques, tandis qu'elle était intermédiaire chez les malades border-line et lépromateux. La comparaison de différentes publications se rapportant à l'âge d'apparition de la maladie en Inde et dans d'autres pays suggère que cet âge varie dans différentes régions à l'intérieur d'un même pays, et de pays à pays.

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