The Age-at-Onset of Leprosy

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The age at which the first signs of leprosy appeared in patients in endemic areas has not been investigated on a planned basis. The main reason might be that it is generally impossible to pinpoint the period at which the first signs made their appearance in a patient. This is particularly so in areas of low endemicity. Even the patients fail to notice them until some relatives or friends draw attention to them. But in highly endemic areas like the one where the study under report is based it was a remarkable thing to find that generally people could easily take note of the first solitary patch in persons in their household or those in the immediate neighbourhood. Another reason could be that patients, specially in the older age groups, may not be able to give a correct answer to the query. 'When did you first notice that you were suffering from leprosy?'

This paper, however, deals with an organized attempt to find out the age at which signs of leprosy were noticed in 3,527 patients detected in a recent survey in a highly endemic District in Madras State (India). All these patients were close-questioned as to the age at which they first noticed signs of leprosy in them. In many instances other members of the household or neighbours helped to corroborate the patient's version. In the case of children, their parents helped to clinch the age at which the signs appeared. The interview and questioning was carried out during the course of four months.

Tables IA and IB give the distribution of age of onset by sex and type.

The points that this Table brings out are:

1. Only in about a third of the total patients the signs of leprosy were first noticed before they were 20 years old, and two-thirds after that age. An appreciable per centage (10 per cent) of patients placed the age of onset above 50.

2. There were as many patients who noticed their first signs before they were about 26 years of age as there were above that age.

3. There were two ages at which large numbers of patients noticed their first signs. In the case of males the largest number centred round the age of 22.7 and a smaller but quite appreciable number at 8.74. The two peaks for the females were 8.4 and 22.7. It is thus seen that the peaks in both sexes are almost the same but the highest peaks for males and females respectively were at 22.7 and 8.4, the second peaks were at just the reverse, i.e. 8.7 and 22.7! We suggest that a plausible explanation may be based on the genetic hypothesis of specific and individual susceptibility to leprosy.

TABLE IA

Distribution of Age at Onset: By Sex and by Type

Age Group	Males	Percentage of Males	Females	Percentage of Females	Total	Percentage of Total	"L" cases	Percentage of "L" cases	"N" cases	Percentage of "N" cases
0.4	74	3.35	63	4.78	137	3.88	1	0.21	136	4.47
5.9	225	10.19	174	13.20	399	11.31	17	3.53	382	12.54
10.14	220	9.96	134	10.17	354	10.04	61	12.65	293	9.62
15.19	228	10.32	108	8.19	336	9.53	64	13.28	272	8.93
20.24	294	13.31	137	10.39	431	12.22	79	16.39	352	11.56
25.29	268	12.13	127	9.64	395	11.20	44	9.12	351	11.53
30.34	232	10.51	135	10.24	367	10.40	75	15.56	292	9.59
35.39	174	7.88	108	8.19	282	7.99	51	10.58	231	7.59
40.44	167	7.57	99	7.51	266	7.54	37	7.68	229	7.52
45.49	114	5.17	77	5.84	191	5.42	29	6.02	162	5.32
50.54	88	3.93	82	6.22	170	4.82	13	2.70	157	5.15
55.59	54	2.45	39	2.96	93	2.64	8	1.66	85	2.79
60.64	37	1.68	22	1.67	59	1.67	2	0.41	57	1.87
65.69	16	0.73	8	0 61	24	0 68	0	0	24	0.79
70.74	12	0.55	1	0.08	13	0.37	0	0	13	0.43
75.79	4	0.18	3	0 23	7	0.20	0	0	7	0.23
80.84	2	0.09	1	0.08	3	0 09	1	0.21	2	0.07
Total	2,209	100.00	1,318	100.00	3,527	100.00	482	100.00	3,045	100.00
Mean.	27.407	—	27.387	—	27 397	—	27 820	—	27.191	—
Median.	26.185	—	26.693	—	26 350	—	27 160	—	26 247	—.
Mode. I.	22.702	—	8.401	—	22.702	—	22 004	—	8 415	—
Mode. II	8.740	—	22.702	—	8.605	—	32 684	—	22 817	—

TABLE IB

Distribution of Age at Onset for three distinct age groups (By Sex and by Type)

Age group	Males Percentage	Females Percentage	Total Percentage	"L" cases Percentage	"N" cases Percentage
0 – 19	33.82	36.34	34.76	29.67	35.56
20 – 49	56.57	51.81	54.77	65.35	53.01
50	9.61	11.85	10.47	4.98	11.33

4. There are also two peaks with regard to the type of the disease. The two ages at which the largest number of patients showed their first signs for 'L' and 'N' types were respectively 22.00 and 8.42 and the lesser peaks at 32.68 and 22.82 years. It is quite possible that all the 'L' type cases could not have originated as 'L' cases.

DISCUSSION

COCHRANE had worked out the age of onset in Madras State and BADGER compared it with that obtained in endemic States of USA. The same is given below in Table II, along with the figures arrived at in the present study for comparison.

It would appear that the age at onset only in those below 15 years in the current study approximated more to COCHRANE's figures than to USA, while it was more akin to USA in persons above 15 years. There were comparatively much fewer people who showed the first leprosy signs above 35 years in COCHRANE's study than in the current one (7 per cent VS 31 per cent).

TABLE II

Comparative Statement of Age at onset in Madras and Endemic States in USA

Age at Onset	Madras State (Cochrane) Percentage	Chingleput District of Madras State (Mohamed Ali) Percentage	Endemic States of USA Percentage (Badger)
0 – 4	6.30	3.88	0.10
5 – 9	13.40	11.31	3.00
10 – 14	15.90	10.04	7.00
15 – 19	19.80	9.53	13.20
20 – 24	21.50	12.22	13.40
25 – 34	16.10	21.60	19.80
35 – 49	7.00	20.95	25.20
Over 49	—	10.47	17.80

BADGER has shown that the age at onset varies in different areas and in the same areas at different times. Therefore it is difficult to say for certain that the difference in COCHRANE's and in the current studies represented any shift in the age at onset especially in respect of the older age groups. It may be mentioned here that COCHRANE based his figures on 2,000 patients in Saidapet (a suburban locality of the same Chingeleput District) and in the Sanatorium at Chingelput. The patients on whom this paper is based are those residing in some of the rural areas of the same district.

The absence of a test analogous to Tuberculin test deprives us of a means of finding out the state of infection (as opposed to state of disease) with regard to leprosy. Therefore it is difficult to work out the latent or incubation period. Various workers have put this period at a varied number of years. ROGERS puts it at $3-5$ years, BADGER at $3-4$ years and the latest Japanese studies at about eight years.

Assuming for arguments' sake that ten years would fairly well cover the most likely incubation periods, the age distribution at the time of infection based on Table II will be as given in Table III (figures for the endemic states in USA are given for comparison).

TABLE III

**Percentage Age of Patients with Age at Onset after deducting
10 years which is assumed as Incubation Period**

	Percentage of Patients	
Age at Infection	*Chingleput District*	*Endemic States in USA*
Under 10	23.07	19.90
Under 15	37.48	34.10
Under 20	50.68	46.40
Over 10	76.93	80.00
Over 15	62.52	65.80
Over 20	49.31	53.50
Over 30	27.61	36.00

The figures in the Table show that, even after assuming ten years as incubation period, about 50 per cent of the patients (*i.e.* 1,760 patients) had got infected after they had passed their 20th year of life, thereby showing that leprosy is not exactly a children's disease. The fact that susceptible adults could also get easily infected if only they came into contact with infection was shown by BADGER. This has also been borne out by the Naurn epidemic.

It would therefore appear that the age of infection is primarily governed by time of contact of a susceptible person with an infectious patient, and there is no age *per se* which is specially vulnerable to infection. Children who '*appear*' to be infected in greater numbers as *susceptible* children because of

their likelihood of intimate contact with their infective parents or rela-
tives, quickly pick up the infection. And this happens not frequently in
leprous families whose members may carry what many authors have
termed 'a predisposing' factor. And here again it has to be admitted that
all or even the majority of children in contact with infective cases and
living under the same environmental, nutritional, and sanitary conditions
do not get infected.

SUMMARY AND CONCLUSIONS

The age of onset of leprosy in respect of 3,527 patients detected during a
recent prevalence survey is analysed and the analysis does not support the
idea 'that the majority of persons acquire leprosy (at least in Chingelput
District) before the age of 20 and that many have been infected by the
time they reach 15 years of age'. Opinion is expressed that the age of
infection is determined by the period at which a susceptible person comes
in contact with infection.

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