INTERNATIONAL JOURNAL OF LEPROSY

Volume 56, Number 2
Printed in the U.S.A.
(ISSN 0148-916X)

INTERNATIONAL JOURNAL OF LEPROSY
And Other Mycobacterial Diseases

VOLUME 56, NUMBER 2 JUNE 1988

Healing Time in Untreated Paucibacillary Leprosy: A Cross-sectional Study[1]

P. Sirumban, Ashok Kumar, and P. N. Neelan[2]

In leprosy hyperendemic areas it is the usual practice to detect leprosy cases through total population surveys by paramedical workers and to motivate the detected cases to take treatment. In spite of these efforts, a proportion of leprosy cases, mostly the paucibacillary (PB) type, do not take treatment anywhere ([2]). These untreated patients are likely to have an increased risk of disease advancement with deformity/disability and of becoming a source of infection. If such patients continue to opt to remain untreated, then the workers are faced with the problem of deciding how long such patients could remain untreated, beyond which they have to make fresh efforts to treat them. If the untreated patients happen to be of the multibacillary (MB) type, this period should be practically negligible. However, in the case of untreated PB leprosy, where self-healing has been reported to be a common phenomenon ([1, 3, 6]), the maximum time for which the patients could opt to remain untreated will be the "time limit" during which a considerable proportion of PB lesions may heal without any antileprosy treatment.

The present cross-sectional study was undertaken with the objectives a) to estimate the healing time (HT) in newly detected, untreated PB leprosy cases in a leprosy-endemic area and b) to study the influence of epidemiological characteristics such as age, sex, and intrafamilial exposure to leprosy prior to onset of disease, as well as the site and number of lesions, on this healing time.

METHODS

Study area and study case-population. The study was carried out in the Rural Field Operation Area of the Central Leprosy Teaching and Research Institute, comprising a population of about 95,000 persons residing in 54 villages in Sriperumbudur Taluk, Chengalpattu District, Tamil Nadu, India. Six cross-sectional surveys for leprosy case detection were carried out in this area over a period of 12 years (1969–1980).

Since 1981, annual total population surveys have been carried out in the same area, using standard criteria for leprosy diagnosis and case-detection methodology as well as a standard recording system. As a routine activity during these annual surveys, all leprosy cases detected by paramedical workers were concurrently confirmed through clinical examination by a trained medical officer and bacteriologically examined by a laboratory technician. However, the histopathological confirmation of these cases was not done,

[1] Received for publication on 26 June 1987; accepted for publication in revised form on 29 December 1987.

[2] P. Sirumban, M.Sc., Senior Statistical Assistant (Statistics); A. Kumar, M.D., Assistant Director (Epidemiology); P. N. Neelan, M.B.B.S., D.P.H., M.P.H., Director, Division of Epidemiology and Statistics, Central Leprosy Teaching and Research Institute, Chengalpattu 603001, Tamil Nadu, India.

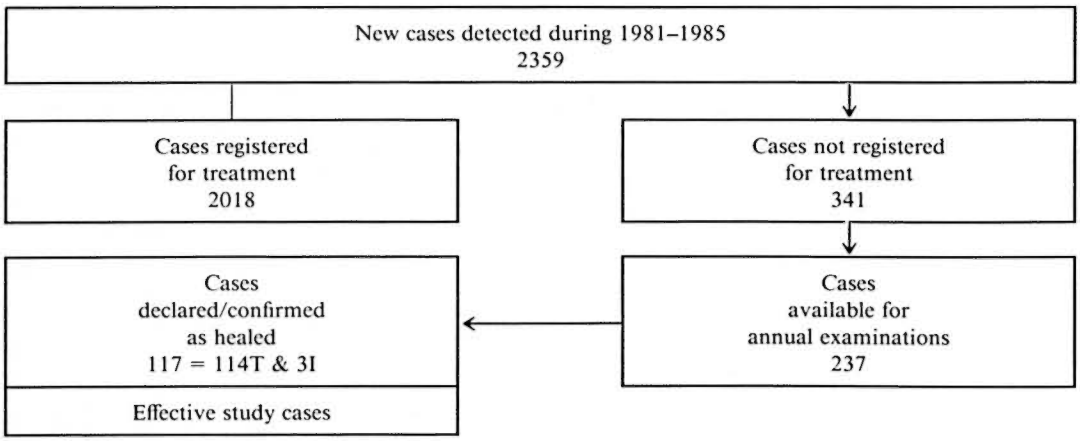

FIG. 1. Schematic representation of study case selection.

since it was not feasible under field conditions. The annual total population surveys carried out in the area enabled the workers to examine all of the leprosy cases, whether they were or were not registered for treatment.

All of the newly detected and confirmed leprosy patients were advised to register for treatment, but some of these patients, mostly of the PB type, did not take treatment either with our leprosy clinic or elsewhere. However, these untreated, PB leprosy patients were clinically examined by the workers during subsequent annual surveys and their progress was recorded. All of the PB leprosy patients whose lesions were considered by the workers as "healed" were referred for further examination to the medical officer who, after following the prescribed criteria ([7]), declared these cases as healed without antileprosy treatment. Such healed PB cases constitute the study population (Fig. 1).

Model, assumption and technique in estimation of healing time. The history and prognosis of a case could be modeled ([5])

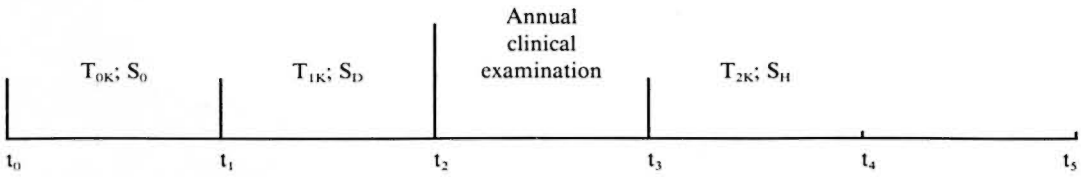

FIG. 2A. Diagrammatic representation of the model.

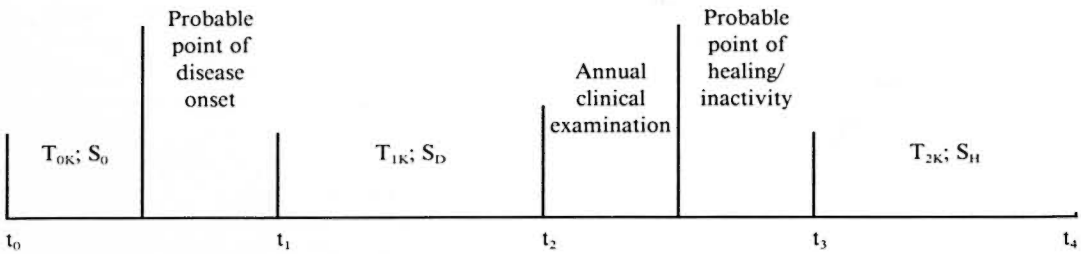

FIG. 2B. Diagrammatic representation of healing time in the case of annual surveys.

from cross-sectional information as follows:

$$H\ (History) = (T_{0K}S_0;\ T_{1K}S_D;\ T_{2K}S_H;\ \ldots)$$

where the subject K was observed, at time T_{0K} in state S_0 (symptom free); at time T_{1K} in state S_D (declared diseased); and at time T_{2K} in state S_H (disease healed or inactive) (Fig. 2A).

In a chronic disease like leprosy, the healing time of a lesion may be defined as the time interval between disease onset (overt disease) and its inactivation or subsidence. This healing time (HT) for case K could be estimated, with the help of the above model, as $HT = T_{2K} - T_{1K}$ under certain assumptions. This system, however, is likely to introduce a certain amount of error due to observational bias in the recording of cross-sectional information. In circumstances where annual clinical examinations are practiced through annual surveys, disease onset as well as disease subsidence is likely to be recorded with a time lag. Therefore, it is reasonable to assume that the bias introduced in the recording of time gets nullified or minimized to a great extent, as illustrated in Figure 2B.

RESULTS AND OBSERVATIONS

The healing time of untreated PB leprosy patients was estimated as 2.03 ± 0.10 (mean ± S.E.) years, with an estimated 95% confidence limit being 1.83–2.23 years. Healing time was estimated as 1.97 ± 0.12 years for children and 2.10 ± 0.10 years for adults. The average time taken for healing of lesions in male patients (1.98 ± 0.14 years) was not significantly different from that in female patients (2.08 ± 0.14 years). It may be inferred that age and sex have little role to play in the prognosis of leprosy in those patients where spontaneous regression occurred.

TABLE 1. *Healing time (mean ± S.E. years) and site of lesion.*

Group	Face	Upper limbs	Thorax, abdomen, back	Lower limbs	Total
Children	1.47 ± 0.12	2.07 ± 0.21	2.60 ± 0.36	1.86 ± 0.19	1.97 ± 0.12
No.	9	15	10	26	60
Adults	1.30 ± 0.17	2.37 ± 0.28	2.65 ± 0.35	1.65 ± 0.23	2.10 ± 0.16
No.	3	23	10	21	57
Total	1.43 ± 0.10	2.25 ± 0.19	2.62 ± 0.25	1.75 ± 0.15	2.03 ± 0.10
No.	12	38	20	47	117
95% CI[a]	1.21–1.65	1.88–2.62	2.10–3.14	1.46–2.04	1.83–2.23

[a] CI = Confidence interval.

TABLE 2. *Year of detection and year of declared healed/inactive of untreated paucibacillary cases (including not healed cases).*

Yr detected	Yr declared inactive/healed					Not healed	Total cases detected	Cases downgraded	Person years of follow-up
	1982	1983	1984	1985	1986				
1981	5	10	1	1	7	10	34	—	105.0
1982	—	13	7	6	4	22	52	1	134.0
1983	—	—	7	8	6	44	65	2	162.5
1984	—	—	—	9	13	43	65	—	110.0
1985	—	—	—	—	20	1	21	—	11.0
Totals	5	23	15	24	50	120	237	3	522.5

Note: Epidemiological characteristics of cases who did not heal/downgraded are comparable with that of cases healed.

Healing rate: (117/522.5) × 100 = 22.4% per year.

Cases likely to downgrade: (3/522.5) × 100 = 0.57% per year.

Cumulative healing rate within 2 years: $\frac{[(5 + 13 + 7 + 9 + 20) + (10 + 7 + 8 + 13)]}{237} \times 100 = 38.8\%.$

The time taken for healing in patients with a single tuberculoid lesion (1.97 ± 0.10 years) was similar to that in patients with two tuberculoid lesions (2.58 ± 0.51 years). Healing in tuberculoid lesions took less time (2.02 ± 0.10 years) than did indeterminate-type lesions (2.37 ± 0.95 years).

Intrafamilial exposure to leprosy prior to onset is not likely to have influenced the process of healing, since the healing time in patients who had prior intrafamilial exposure (1.86 ± 0.16 years) was similar to those patients who did not have any intrafamilial exposure (2.08 ± 0.12 years).

Lesions on the face in both children and adults took less time to heal than did lesions on the thorax, abdomen, and back (Table 1).

The rate of healing among untreated PB leprosy cases was calculated by using a modified "life table" technique ([4]), and was estimated as 22.4% per year. Using the same method, it was observed that 0.57% of cases are likely to downgrade per year (Table 2) if they remain untreated.

DISCUSSION

Self-healing or spontaneous regression in PB leprosy has been a well-recognized phenomenon. Lara and Nolasco ([3]), during 24 years of follow up, observed that "unquestionable leprosy lesions" developed in children of known leprosy parents underwent spontaneous regression in about three fourths of the cases. They also reported that the "average healing time for all cases with undifferentiated histology was 2.0 years; for those with tuberculoid lesions it was 3.25 years." Ramanujam ([6]) also observed a high proportion of spontaneous healing in children with major tuberculoid (98.7%), minor tuberculoid (78%), and maculo anesthetic leprosy lesions (55%) ([6]). Browne ([1]) reported that one third of all the new "tuberculoid" and "indeterminate" type cases detected over a 2-year period underwent spontaneous regression, without any anti-leprosy treatment, within 2 or more years, and this self-healing process was not influenced by sex, age or intrafamilial leprosy contact of these patients.

In the present study, based on 5 years of continuous observation, the healing time was estimated as 2.03 ± 0.10 years. Of the PB cases who were detected and remained untreated during the 5-year period, 38.8% were estimated to have healed within 2 years of their detection.

The studies carried out at different intervals hint that untreated PB lesions may take approximately 2 years to heal. Among the patients followed up under observation, those who fail to take treatment in spite of motivation and who remain active for more than 2 years have a risk of worsening and transmitting the disease. Renewed efforts should be made to bring them under regular treatment. Since it is difficult to identify the type of cases which would heal spontaneously, every effort should be made to detect all leprosy cases early and put them on treatment.

SUMMARY

The healing time of leprosy lesions in 117 paucibacillary (PB) cases who took no antileprosy treatment was estimated to be 2.03 ± 0.10 (mean ± S.E.) years in a leprosy hyperendemic area. This healing time does not appear to be influenced by epidemiological characteristics of the patients such as age, sex, intrafamilial leprosy contact status, number and site of leprosy lesions, etc. It was also observed that the rate of healing and downgrading among the total untreated cases was 22.4% and 0.57%, respectively, per year. About 39% of the total untreated PB leprosy cases healed within a period of 2 years. The scientific implication of this observation is discussed.

RESUMEN

El tiempo de curación de las lesiones leprosas en 117 casos paucibacilares (PB) sin tratamiento antileproso resultó ser de 2.03 ± 0.10 (media ± E.S.) años en una zona hiperendémica de lepra. Este tiempo de curación no parece estar influenciado por características epidemiológicas de los pacientes tales como edad, sexo, grado de contacto intrafamiliar, número y sitio de las lesiones leprosas, etc. También se observó que la frecuencia anual de curación y de empeoramiento entre el total de casos no tratados fué del 22.4% y del 0.57%, respectivamente. Aproximadamente el 39% del total de casos PB no tratados sanaron en un período de 2 años. Se discuten las implicaciones científicas de esta observación.

RÉSUMÉ

Dans une région hyperendémique pour la lèpre, on a estimé à 2,03 ± 0,10 années le temps nécessaire

pour la guérison des lésions de lèpre, chez 117 malades paucibacillaires (PB), en l'absence de traitement contre la maladie. Cette durée ne paraît pas être influencée par des caractéristiques épidémiologiques du malade telles que l'âge, le sexe, l'existence d'un contact intrafamilial, le nombre ou le type des lésions de lèpre. On a également observé que le taux de guérison et de régression chez l'ensemble des malades non traités était respectivement de 22,4% et 0,57% par an. Environ 39% des cas de lèpre paucibacillaire non traités, guérissaient dans les deux ans. Les implications scientifiques de ces observations sont discutées.

Acknowledgments. The services of all the paramedical workers and medical officers who were involved in the case detection and case confirmation program are acknowledged thankfully. The statistical assistance of Kum. K. Anusuya, Sr. Computer, and the secretarial assistance of Kum. C. Padma, stenographer, for this work are gratefully acknowledged.

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