A STUDY OF CONJUGAL LEPROSY[1]

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Conjugal leprosy has been one of the puzzles in the epidemiology of leprosy. Why a wife or a husband does not contract leprosy from an affected husband or wife, if leprosy is a contagious disease, has mystified many an earlier leprologist. If prolonged intimate exposure, once considered essential in transmission of the disease, is the determining factor, none can deny that no better milieu exists for transfer of disease than that between married partners. The fact is that the incidence of conjugal leprosy is surprisingly low, as compared with familial leprosy in general. In order to determine the extent of marital leprosy in the area operated by the Central Leprosy Teaching and Research Institute, a survey was conducted in 1964.

METHODS AND RESULTS

A general (census) survey ([6]) of a population of more than 200,000, in about 300 villages in the Chingleput District of Madras State, was conducted in 1962 by the Central Leprosy Teaching and Research Institute officers and a team of 25 well-trained paramedical staff workers. Of this population 96 per cent were examined. During the survey a total of 4,384 leprosy patients were discovered. It was among these patients that the survey of marital leprosy was carried out. A protocol (Fig. 1) was drawn up to register the data, and 22 paramedical workers, who were posted in different parts of the area for DDS prophylaxis, were charged with the collection of data in the prescribed form. The survey took six months to complete.

Data collected.—Data of general nature, collected during the survey, are given in Table 1. It will be seen from the table that only 106 (5.5%) spouses living with an affected partner contracted leprosy after marriage.

Period of contact.—Table 2 shows the duration of contact of spouses who became infected.

Since the incubation period of leprosy is not known definitely, it is debatable whether the 54 spouses who showed evidence of the disease within 5 years after marriage actually acquired the infection from their partners, or contracted it before marriage in this highly endemic area. Also in the case of nine spouses (one husband and eight wives), there was a history of leprosy among relatives. Three of them with leprotic relatives showed signs of the disease within three years after marriage, as shown in Table 3.

In the light of the facts given in Tables 2 and 3 it would be unjustifiable to put down all of the 106 spouses as having contracted the disease directly from their affected partners. Therefore the actual rate of conjugal leprosy in our series may have been much lower than the calculated 5.5 per cent.

Type and bacteriologic status of index cases and incidence of the disease.—Of the affected partners of the 106 spouses who acquired the disease after marriage only 16 were bacteriologically positive at the time of the survey, while the remaining 90 were negative. Of the 1,830 previously affected spouses, 49 (37 lepromatous cases and 12 tuberculoid cases) were bacteriologically positive, and in spite of the period of prolonged and intimate contact, ranging from 1 to 30 years, their 49 partners remained free from the disease. Table 4 summarizes these facts.

Taken simply at their face value these figures might seem to indicate that 27 (38 minus 11) patients with lepromatous disease, even though bacteriologically negative, in-

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TABLE 1.—*Showing the number of couples under study and the wife and/or husband affected with leprosy at the time of survey.*

Affected with leprosy				
One spouse or both	One spouse only	Both spouses		Per cent After marriage
		Before marriage	After marriage	
1,968	1,830	32	106	5.5

No. wives remaining healthy, husband affected before marriage.	No. husbands remaining healthy, wife affected before marriage.	Only wife or husband affected before marriage, other spouse contracted disease after marriage.
1,276	554	106

TABLE 2.—*Number and percentage of spouses becoming infected and duration of contact.*

Duration of contact	Number exposed	Number affected	Per cent affected
Under 1 year	20	7	0.36
1- 4 years	544	47	2.43
5- 9 "	697	30	1.55
10-14 "	320	12	0.62
15-19 "	154	8	0.41
20-24 "	100	2	0.10
Total	1,936	106	5.47

TABLE 3.—*Relationship before marriage and family history of nine spouses out of 106 who contracted leprosy after marriage.*

Spouse no.	Relationship before marriage	Affected spouse after marriage	Duration of contact before contracting disease (years)	Family history Affected relative
1	None	Wife	1	Father
2	None	Husband	2	Aunt
3	Uncle's daughter	Wife	3	Brother
4	Uncle's daughter	Wife	6	Uncle
5	None	Wife	6	Stepfather
6	Uncle's daughter	Wife	7	Uncle
7	Sister's daughter	Wife	10	Father
8	Sister's daughter	Wife	12	Mother
9	Sister's daughter	Wife	19	Uncle

duced the disease in their partners, and that 63 (68 minus 5) with the tuberculoid type did likewise.

It is of course possible that the bacteriologic status of patients did not remain stationary and that the usual methods of smearing and staining would disclose that a number of them had become negative as a result of treatment, which was available in their areas. But it will be difficult to maintain that all these index cases, including 249

TABLE 4. *Type of bacteriologic status of index cases of affected and unaffected spouses.*

Number of spouses	Total	Type of index cases and their bacteriologic status	
		L type	T type
Affected after marriage with leprotic partners	106 (16 pos.)	38 (11 pos.)	68 (5 pos.)
Not affected in spite of living with leprotic partners	1,830 (49 pos.)	249 (37 pos.)	1,581 (12 pos.)
Total	1,936 (65 pos.)	287 (48 pos.)	1,649 (17 pos.)

(287 minus 38) lepromatous type patients, who did not produce disease in their spouses, were not discharging leprosy bacilli during the entire period of married life up to the time of the survey, and that 90 (106 minus 16) spouses who acquired the disease after marriage contracted it without their bacteriologically negative partners shedding bacilli.

DISCUSSION

The incidence of leprosy among spouses living with affected partners has been found low by most of the workers who have investigated the subject. Quagliato ([8]) found it to be 7.8 per cent, Basombrio *et al* ([2]) 4.4 per cent, Do Pateo ([4]) 14.1 per cent, and Bechelli ([3]) 9.7 per cent. Arcos ([1]) found no incidence whatever among healthy spouses living with 150 patients. Thus, except for one report ([4]), the conjugal leprosy rate has been recorded as low.

The reasons advanced for this low incidence under circumstances in which transmission of contagion would seem most likely to take place, have been three: (1) adult insusceptibility, (2) feebly infectious character of leprosy, and (3) absence of a "predisposing" factor.

That adults are as frequently affected as children, or even more so, has been proved during the course of various studies ([6,7]) conducted in the Central Leprosy Teaching and Research Institute. It has been shown that leprosy is not particularly a disease of children, and that no age is either resistant or particularly vulnerable to acquisition of the disease. As precise knowledge of the incubation period is still lacking, and since we have no means for detecting infection (as opposed to incidence of the disease) by a procedure analogous to the tuberculin test, we must perforce fall back upon the appearance of signs and symptoms in dealing with problems in leprosy such as adult insusceptibility.

That there is no adult insusceptibility, as such, has been amply demonstrated by events in the epidemics of leprosy that occurred in the South Pacific Island of Nauru in 1924 ([9]), where the disease wrought havoc among the population in the short period of 4 years, making no distinction whatever between young and old. The same story, more or less, was repeated after World War II in Molubu Island off the coast of Western New Guinea ([5]).

CONJUGAL LEPROSY

I. Name of village; House No. Family No. Sector No.

II. Particulars of couples:	Husband	Wife
1. Name		
2. Age		
3. Age at onset		
4. Type		
5. Year of marriage		
6. Site of mother lesion		
7. Were they related before marriage? If so how?		

III. Particulars about children:

Name	Age	Sex	If affected	
			Type	Age at onset
1.				
2.				
3.				
4.				
5.				
6.				

IV. History of leprosy of any other members in the family and relationship:

V. Family history of leprosy from relations (dead or alive):

Husband's side	Wife's side

VI. Any other particulars:

Investigator:

Date:

FIG. 1.—Protocol for survey of incidence of conjugal leprosy.

Thus the foundation on which a hypothesis of adult insusceptibility has been built up, has been severely shaken, and can therefore no longer be considered tenable.

The low grade character of infection with leprosy has been used to explain the low marital rate. The foundation on which this theory has been based is equally shaky. Many patients do not remember ever having come in contact with a patient before they acquired the disease. In these cases it is clear that the contact, which is essential to transmit infection, could have been anything but prolonged or intimate, and therefore quite casual. And if such a casual contact could produce the disease, leprosy must be considered very highly infectious. Thus we have two diametrically opposed ideas as to the infectious nature of leprosy, which could be resolved only by admitting the possibility of an extraneous factor in the causation of the disease. This is implied in the third reason given above, viz., a "predisposition" in future victims of the disease.

The explanation for many puzzling epidemiologic anomalies in leprosy, including the seemingly inexplicable rarity of conjugal incidence of the disease, probably lies in a dual etiology, viz., *M. leprae* and this "predisposition." Baffled by finding the spread of leprosy quite out of keeping with the rules of contagion, many workers in their desperation in the past have been compelled to conjure up extraneous factors other than the bacilli. Not knowing the exact nature of the factor involved they have called it by various names. Thus, we have, Hirsch's "morbid diathesis," Muir's "predisposition," "Fernández' "unknown constitutional factor," Rotberg's "N factor," Wade's "inherent and fundamental factor," etc. Some investigators simply put it as a frank hereditary factor. The discovery of a concentration of cases in family lines has led others to designate the factor as familial susceptibility. The picture is now becoming more clear, and the concept of a dual etiology in the causation of leprosy is slowly emerging, viz., host susceptibility on the one hand and *M. leprae* on the other. This genetic hypothesis will explain, *inter alia*, why all, or even an appreciable number, of exposed contacts do not acquire the disease; and why those who are susceptible acquire it, irrespective of age, when they come in contact, even a casual one, with a leprotic patient, lepromatous or nonlepromatous, who may be shedding leprosy bacilli.

SUMMARY

Data on 1,830 married couples, with one member of the pair suffering from leprosy, and 106 spouses who acquired the disease apparently from their affected partners, are presented and discussed. It is suggested that genetically determined individual resistance might be responsible for the low incidence of marital leprosy.

RESUMEN

Se presentan y discuten los datos sobre 1830 parjas de matrimonios, con uno de los miembros del par sufriendo de lepra, y 106 esposas que aparentemente adquirieron la enfermedad del esposo afectado. Se sugiere que la resistencia individual geneticamente determinada, puede ser responsable por la baja incidencia de lepra marital.

RESUMÉ

Des données sont ici présentées et discutées, se rapportant á 1830 couples mariés dont un conjoint souffrait de lépre, et á 106 conjoints ayant, semble-t-il, contracté l'affection de leur partenaire malade. Il est suggéré qu'une résistance individuelle génétiquement déterminée pourrait être responsable de la faible incidence de lépre conjuguale.

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