INTERNATIONAL JOURNAL OF LEPROSY

PUBLISHED AS THE OFFICIAL ORGAN OF THE INTERNATIONAL LEPROSY ASSOCIATION WITH THE AID OF THE LEONARD WOOD MEMORIAL

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Entered at the Post Office at Cleveland as second-class matter.

Vol. 12 Third Special War Number and Volume 1944

EDITORIALS

Editorials are written by members of the Editorial Board and opinions expressed are those of the writers.

FIELD STUDIES IN THE PHILIPPINES

A dozen years have elapsed since the Leonard Wood Memorial decided to give substantial support to field studies of leprosy. The first areas chosen were in the Philippines where the Memorial had previously assisted in the development of Culion and had constructed at Cebu the Eversley Childs Treatment Station and the Skin Dispensary. For more than three years progress has been halted by the war. This interruption is very serious because the value of such studies depends in large part upon continuity of records over a prolonged period. Nevertheless, it affords an opportunity to survey accomplishments, to appraise the present position, and to look to the future.

Earlier studies on the epidemiology of leprosy in the Philippines were restricted in scope to information obtained from patients in segregation. This narrowed the clinical field by omission of many early lepromatous cases and of bacteriologically-negative macular and other neural cases. It narrowed the epidemiological possibilities to study of those items which a patient, sometimes long removed from his family, could remember concerning his personal and family history and his early environment. It is obvious that such historical information would suffer from deficiencies and inaccuracies which might be remedied to a greater or less degree by questioning of parents and other relatives. Nevertheless interesting attempts were made, notably by Denney in 1917 who discussed such questions as place of origin, history of contact, age at onset, sex, and relative prevalence in different tribal

and geographic groups. The chief criticism directed against studies which are restricted to institutional groups is that only a part of the picture is seen, a fact fully recognized by Denney. As is true generally in medicine, the accepted clinical syndrome, prognosis, and opinion regarding efficacy of therapeutic agents are based upon observation of the more severe cases.

Rodriguez was the first to seek the explanation of peculiarities in geographic distribution by field investigation. In examining Bureau of Health statistics for the Province of Cebu, he noted great variation in prevalence as between the various municipalities and urged that thorough epidemiological studies be undertaken in that province. To prove their practicability, he initiated familial investigations on Mactan Island, in Cebu Harbor, visiting the homes personally. His report and recommendations were supported enthusiastically by Dr. Wade, Medical Director of the Memorial. As a consequence of these events and after the approval of the Bureau of Health had been obtained the Memorial decided to give financial support. In 1933 the writer was sent to the Philippines, and, in collaboration with Drs. Wade, Rodriguez, and Plantilla, plans were laid for field studies in different sections of Cebu, commencing with the municipality of Cordova, on Mactan. A promising young physician, Dr. Ricardo Guinto, was engaged as assistant epidemiologist, and a field staff was organized.

These prosaic statements do scant justice to the change in public sentiment towards leprosy which had gradually taken place and to the fact that this change was not generally appreciated. The view which prevailed previously was that the inhabitants would be resistant to family investigation, and that questioning would elicit only refusal, evasion, or falsehood. On the contrary, the field workers were received with courtesy and responses were made in a most friendly and cooperative manner.

Field studies have a variety of purposes. They may be essentially pragmatic, and in no disease are basic facts more glaringly deficient than in leprosy. The obstacles are men and money. *Prevalence* can be learned by relatively simple procedures; but it does demand physical examination of entire populations or at least of representative samples. *Incidence* can be determined accurately only by repeated surveys but may be estimated, at least for more serious forms of the disease, by properly designed historical familial studies. Considering the seriousness of leprosy and the relative ease with which it may be recognized, it is another commentary on human retardation that such elementary data are still wanting for most countries in which the disease is a serious problem.

In Cordova the prevalence rate was found to be 17 per 1,000. In Talisay, on the mainland and the second area studied, it was 20. The incidence rate for both communities combined was estimated to have been 1.2 cases per 1,000 population annually, an average rate covering the life experience of persons whose histories were obtained. The high incidence among children

of 10 to 14 years is especially noteworthy, being more than 3 per 1,000 per annum. A rough check of the accuracy of incidence figures was obtained by cumulating the estimated rates for each year of age from birth to 25 years. Assuming that leprosy patients do not have a much higher death rate than persons of the same ages in the general population, there would have been an "accumulated" prevalence of 39 leprous persons per 1,000 population at the time of the survey in Cordova. An actual prevalence of 40 per 1,000 was found among the inhabitants who were 20 to 30 years of age in 1933. The exactness is of course fortuitous but the computation indicates that the historical method yielded accurate information concerning the attack rates which had prevailed in Cordova.

The trend of leprosy in an area is obviously a matter of great practical importance. It is the only reliable guide as to efficacy of control measures and to future needs in terms of clinics and leprosaria. Because in leprosy any trend upwards or downwards may be expected to be slow, it will require many years to answer the question for any area by means of repeated prevalence surveys. Historical studies may throw immediate light on the trend of the disease, especially if the population has been relatively unaffected by migration. In analysing data for this purpose the life experience represented on the family schedules should be broken at selected dates. Attempts are now being made to determine the value of the Cordova records in determining trend. It is admitted, however, that for most of the leprosy world the trend of the disease must be learned the hard way, that is, by prevalence surveys repeated at intervals over a considerable period.

It would be expected that change in trend would be reflected first among children. Further consideration should be given therefore to the results of physical examination of school children. Annual examination of children, supplemented by complete surveys of the population every five years, might be sufficient, especially if accompanied by educational measures designed to encourage current notification.

To the health officer, the practical problem which arises immediately following segregation of the patient is the examination of the household associates. A large series will be necessary to determine the prevalence of leprosy among such persons, a much larger number than were included in the Philippine series.

On the question of what happens in these households over a period of years, very significant findings have been made. For persons exposed to all types of leprosy, the average incidence was 5 per 1,000 annually. This is more than four times the rate for the whole community (1.2 per 1,000) and more than six times that for persons not known to have been exposed. The highest rate was again in the age group 10 to 14 years and especially in males of these ages, of whom 20 per 1,000 were attacked each year.

Readers who are not inclined to statistics may be reminded that other

workers have expressed the risk of contact with a leprous person in a different way, that is, by stating the percentage of their patients from whom a history of contact with a preceding case had been obtained. The significance of these statements, however, is seldom clear because it depends upon the proportion of persons who would give such a history if the entire population or a random sample were similarly questioned. In Cordova 38.5 per cent of patients gave a history of household exposure to the disease. Only 8 per cent of the entire population gave such a history. This ratio of more than four to one is, of course, merely a restatement, since, as will be recognized by most readers, no new factors have been introduced into the arithmetical computation.

When the primary case was lepromatous, the risk of developing leprosy increased more than eight times for individuals exposed in the household. Cumulation of age-specific rates from birth to 25 years for those subjected to such exposure yields an expected prevalence of 293 per 1,000 for males and 140 per 1,000 for females.

It is startling to realize that more than one fourth of all male persons exposed in the home to lepromatous leprosy may be expected to develop the disease, especially in an area where segregation of open cases has been compulsory for many years. It should be mentioned, however, that some of the life experience included antedates active enforcement of this regulation.

In sharp contrast to these findings is the fact that household associates of persons suffering from neural leprosy did not exhibit attack rates significantly higher than those of the general population.

The incidence rates experienced by household associates of persons with lepromatous leprosy may be compared to the risk of developing active pulmonary tuberculosis when exposed to tuberculosis in the family. Several authors are in agreement that the incidence rate for those exposed to sputum positive or fatal cases is in the neighborhood of 10 per 1,000 per annum. This is only about twice as high as the rates observed for leprosy in Cordova and Talisay households but it must be borne in mind that the figures for tuberculosis were obtained from temperate climates in which housing conditions and other factors are not comparable to those in the Philippines. The time has arrived, however, for reappraisal of the relative infectiousness of tuberculosis and leprosy.

These high attack rates for familial associates and the fact that the rate appears to be directly correlated with the age at exposure, indicate again that infants and small children should not under any circumstances be subjected to household exposure to lepromatous cases. A corollary which is equally important is that vigorous efforts should be made to discover and to isolate persons having lepromatous leprosy in its earliest stages.

So much for immediate practical values! Viewed from the theoretical angle, prevalence and incidence rates are the tools with which we seek a

rational explanation of the selectivity of leprosy. Variations in rates must be examined closely for some associated variable. In animal experiments we can determine in advance that test and control groups shall differ only with respect to a single factor which is under investigation. In the human family we must accept the conditions which nature provides, and seek in reverse a variant which may be responsible for observed differences in rates. Regardless of the mechanism this variant must affect resistance or exposure.

The two groups upon which we have placed so much emphasis, respectively exposed and not exposed in the household, differ as far as is known only in this respect. The first assumption therefore is that exposure to leprosy is a factor of the first importance and, as a corollary, that the leprous person is the chief source of infection.

But what explanation can be offered for the large proportion of cases in persons who deny household exposure to the disease? It must be remembered that when histories of contact are sought we are making inquiry regarding possibly casual events which may have occurred many years before. The writer has never been satisfied that this phase of the epidemiology of leprosy has been thoroughly explored. A careful investigation should be made of the exposure history of a series of early cases in children. Perhaps the best area for such a study would be rural, with poor transportation facilities and a relatively low prevalence rate.

Granted as seems probable that the leprous person is the sole source of infection, there is still the great unsolved problem of the mode of transmission of the disease. A high concentration of cases around the recognized sources renders unlikely an arthropod vector with a considerable flying range. Such objection would not apply to the louse, bedbug, tick, and mite.

In leprosy as in tuberculosis it often has been asserted that family susceptibility is a major factor. The tendency of leprosy to persist in small foci in New Brunswick, Norway, and certain other countries in temperate climates, give support to this view. It is, however, quite likely that as a chronic infectious disease dies out in a locality, if spread by direct transfer from cases only, it becomes more concentrated in households with previous cases. The question of inherited susceptibility is one on which light might be thrown by more intensified field investigation, especially to determine comparative incidence rates for blood and non-blood relatives in invaded households.

In Cordova and Talisay, a study of the excess prevalence of lepromatous leprosy among males has eliminated at least one suggested explanation, namely, that in males the disease has a longer duration than in females. This might result in lower prevalence even if attack rates for females were actually higher than for males. A relatively simple examination of the relationship between prevalence and incidence in males and females respectively was sufficient to show that males have not only a higher prevalence rate but also a definitely higher risk of contracting lepromatous leprosy. The underlying

reason remains as great a mystery as ever. Males appear to be more susceptible by inheritance or to become so by reason of some peculiarity of environment. It is improbable that they are more exposed than females.

There are environmental factors which may affect resistance to leprosy which have not yet been the subject of serious inquiry. Among these are diet, occupation, bathing and other hygienic habits.

The Philippine studies were designed to be the basis for repeated surveys, and for more intensive investigations. It will be discouraging indeed if this foundation has been lost.

JAMES A. DOULL