# THE CLASSIFICATION OF LEPROSY IN EASTERN CHINA

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The problem of the classification of cases of leprosy is one on which no full agreement has been reached despite many attempts by leprologists over a long period of years. Recommendations were made by the Leonard Wood Memorial Conference in Manila (1931), and these were modified by the International Congress in Cairo (1938). A different system was adopted by the Second Pan-American Conference in Rio de Janeiro (1946), and later by the Fifth International Congress in Havana (1948). Neither of these classifications, however, has gained universal acceptance. There would seem to be two reasons for this. First, that these classifications have been largely dependent on accurate histological examination; and second that they fail to allow for racial differences. But, in the first place, leprosy is often most prevalent in regions where histological examinations are impracticable. On the other hand there can be no question that if the types themselves do not actually differ among different races, the relative proportions of them differ very greatly. Ryrie (3) has made this clear in his article on regional differences in Malaya, and our own experience fully bears this out.

It would seem desirable, therefore, to place on record some figures of cases seen in our leprosy hospital and its associated settlement. The number of cases here recorded is not very large, 250 in all, but each one has been carefully studied and, as far as possible, histological examinations were made where doubt arose as to classification. It should, however, be noted that it has been quite impossible to carry out lepromin tests on any but a very few of these patients. This has been unavoid-

[1] Dr. Maxwell died, on August 10, 1951, before the manuscript was finally prepared for submission. That was done by Mrs. Maxwell, with the help of Dr. Stephen D. Sturton of Hangchow and Dr. Neil D. Fraser of Hong Kong. The edited copy has been approved by the latter.

able because, despite generous attempts of friends to supply us with the material, political conditions have made its importation impossible. It has also been impossible to secure suitable material from our own patients to make lepromin locally. This in itself suggests a difference at least in the relative proportion and kind of lepromatous cases here as compared with similar places in the West.

This hospital is located in the city of Hangchow, some 100-odd miles southwest of Shanghai, in the Province of Chekiang, and the leprosarium is in its neighborhood. The latter is the only leprosarium in the province, the total population of which is some 21,000,000 people. Formerly, Maxwell (2) estimated the leprosy incidence in the province at about 1 per thousand of the population, and our experience here gives no reason to suppose that this is in any way an extravagant estimate. Chekiang, therefore, compared with provinces in South China, is not a heavily infected area as regards the province as a whole, but the distribution of our cases at least suggests that, while in certain areas leprosy is rare, in others the disease affects a large and possibly increasing percentage of the population. In the north of this province the country has suffered greatly from wholesale massacres by the Japanese during their invasion (1937-1945), and from civil disturbances since then. The southern half of Chekiang was comparatively little affected by the fighting and the incidence here seems to remain as before, but in the northern part new and heavily infected centers have arisen. From one of the northern counties (Tsong-teh) cases of leprosy coming to this leprosarium in the days before the Japanese war were rare, whereas in the last two years we have admitted 35 patients from this county alone, and have records of 27 more waiting for admission to our overcrowded institution. All of these patients give a history of development of symptoms since the time of the war.

While the bulk of our patients come from this province, there are a number from the more northerly province of Shantung. It is important to note that the eastern portion of Shantung is one of the most heavily leprosy-infected areas in the whole of China, and that there is reason to think that the disease there is indigenous and not due to spread from the south, whereas leprosy in South China would seem to have spread northwards from Indo-China.

As already stated, the majority of our patients (76.4%)

come from Chekiang and the borders of the adjacent provinces. A few (8%) have come from the Shantung area, and the rest (15.6%) from other provinces of China, not a few of them soldiers sent in by the Army authorities from the local garrison.

In all of these groups it has been found quite impossible to adhere strictly to the recommended classifications, especially that of the Havana Congress which seems to include all neural cases under the term "tuberculoid." To use a histological term, tuberculoid, in any except a histological sense seems absurd, and many of our neural cases are *not* tuberculoid, neither in the histological sense nor in their clinical appearance.

As regards lepromatous cases, we are again up against a difficulty in that what are called primary lepromatous appear to be rare, if indeed they occur at all among Chinese patients here. Ryrie, in the paper already referred to, met with the same problem in his Chinese patients in Malaya. The passage is worth quoting:

"In almost every case of lepromatous leprosy among Chinese where a reliable history can be obtained, the evidence suggests that the condition when first observed was tuberculoid and later became lepromatous." ". . . the evidence seems to suggest that most if not all of the lepromatous cases have previously passed through a tuberculoid phase."

We are in entire agreement with this statement from our experience with Chinese patients, except for Ryrie's use of the term "tuberculoid"; for it the term "neural" should, in our opinion, be substituted. But if this is so, and we are convinced it is correct, then much too important a place is given to the position of lepromatous leprosy in the classification of the disease. There was plenty of excuse for this in former days before modern treatment had altered the picture, but no case should now reach the stage of complete facial disfigurement which gave rise to the popular idea of the "leper." Ryrie goes still further: "From this point of view the simplest and most logical classification would be, primary (the early macule), secondary (tuberculoid) and tertiary (lepromatous). It would of course be recognized that the majority of cases of primary and secondary leprosy never advance to the tertiary stage." To us, with the substitution of the word neural for tuberculoid, this is a very attractive suggestion.

It will be seen, then, that Ryrie's experience with Chinese in Malaya and ours with patients in China do not at all correspond to the definition of the Cairo Congress as regards cases of the lepromatous type. Its definition as quoted by Cochrane (1a) includes this statement:

"Disturbances of polyneuritic nature may or may not be present; they are

usually absent in the earlier stages and present in the later stages of primarily lepromatous cases, and [are] often present in cases arising secondarily from the neural form."

On the contrary, our own experience with Chinese patients suggests that there are no primarily lepromatous cases, but that *all* cases of lepromatous leprosy show alterations of sensation from the first and that in a very large majority of them there is a neural stage with very definite polyneuritic symptoms long preceding any lepromatous manifestations.

For our own personal use in classification we have employed the subdivision of neural cases as suggested by Cochrane (3b) :[3]

Anaesthetic (non-macular, polyneuritic) (Na)
Simple macular (with flat macules) (Ns)
Tuberculoid macular (minor and major) (Nt)

This leaves out of account the so-called "incharacteristic" group of the Pan-American Conference, but it is our belief that all such cases would find their place in the Ns group. In cases clinically of this form we have found that the histological appearance does not differ materially from that of the Ns form.

One special problem has to be noted here. Many of the patients come to us only after there have been active signs of leprosy for at least two or three years, some of them after very much longer periods. One is therefore largely dependent on the accuracy of the history that can be obtained from the patients themselves. How far is this dependable? Our experience is that, with respect to the first gross manifestation of the disease, the patient's history is perfectly reliable. Because of the social stigma attached to it, the first recognizable manifestations of the disease leave a profound impression on the patient's mind and memory, and the history of these manifestations is perfectly reliable as far as it goes. By this we mean that the patient will give a clear history of his earliest symptoms from the time that he first recognized them. The fact remains, however, that anesthesia may have existed for some considerable time before the patient realized it. This is clear from the number of cases in which the first recognized symptom was a severe but painless burn or traumatism, implying a pre-existing anesthesia which may have been present for some little time. Evanescent early rashes, if there have been such, usually go unrecognized or in any case are not associated in the victim's mind with subsequent developments of leprosy.

[3] Actually, Cochrane merely reproduced *in toto* the Cairo classification, with certain minor changes of editorial nature.—EDITOR

In the following tabulation we give the classification of the cases on which this paper is based, according to the headings given above, and discuss our findings.

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| Na | Anesthetic, nonmacular, polyneuritic | 44, or 17.6 per cent |
| Na-L | Primarily Na becoming lepromatous | 23, or 9.2 per cent |
| Ns | Simple macular, polyneuritic symptoms | 36, or 14.4 per cent |
| Ns-L | Primarily Ns becoming lepromatous | 9, or 3.6 per cent |
| Nt | Tuberculoid macular, polyneuritic symptoms | 94, or 37.6 per cent |
| Nt-L | Primarily Nt becoming lepromatous | 44, or 17.6 per cent |

The nonmacular anesthetic (Na) cases are those which gave no history of a rash, had no rash present on examination, and showed no changes in the skin suggestive of a previous rash. This of course does not exclude the possibility of early evanescent rashes leaving no sign on the skin. With a few exceptions, smears from these cases from the nose, ear and skin were negative to routine examinations.

The cases classed as primarily Na but becoming lepromatous (Na-L) are of patients who gave a clear history of polyneuritic symptoms for a long period previous to the appearance of lepromatous symptoms, with a maximum of 17 years and a minimum of 1 year; the average length of this period was 7 years. During this time these patients had only sensory and trophic changes leading to multiple contractions of fingers and toes and damage thereto. They gave no history of rash and showed no signs of old rashes existing prior to the lepromatous developments.

The cases recorded as simple macular (Ns) include what are called "incharacteristic." As far as possible full histological examinations of these cases were made. This was not always possible, and some error may have arisen between these and Nt cases. There appear to be borderline cases not quite typical of either form, where the lack of histological examination makes confusion possible. Smear examinations were often negative, but occasionally positive up to 2-plus.

In the cases primarily Ns but becoming lepromatous (Ns-L), polyneuritic symptoms and macular rashes were present on an average of 3½ years before lepromatous symptoms developed, and as a rule there remained in the skin well-marked evidence of such rashes.

The tuberculoid macular (Nt) cases formed the largest single group (37.6%), and if we include the Nt-L group they comprise more than one-half of our patients. They exhibited a sharper and better defined edge to the eruption than the Ns

cases as a rule, although some of them resembled that type of lesion rather closely and a few could be placed with certainty only after histological examination. On the other hand, the tendency to clearing up in the centers distinguished these cases easily from typical lepromatous cases. The bacteriological reports on this group have been interesting. These were: routine nose, ear, and skin smears repeatedly negative in 60 per cent of the cases; occasionally positive or 1-plus in a further 25 per cent; 6 per cent were 2-plus in the course of lepra reaction; while 9 per cent were constantly positive up to 2-plus.

Of the cases primarily Nt but becoming lepromatous (Nt-L), more than one-half showed well-marked polyneuritic symptoms prior to the tuberculoid phase. In rather less than one-half the first-noticed symptoms were tuberculoid, without well-marked sensory changes, although in some well-marked polyneuritic symptoms might follow.

It will be noticed that, of our 250 patients, not one is classed as primarily lepromatous. In all but a few cases of the tuberculoid form the first symptoms were polyneuritic, and it is at least possible that marked sensory changes may have passed unnoticed in some of these. This possibility is emphasized by the number of instances of painless burns or traumata which called attention to a pre-existant anesthesia which had not been noticed.

It should be stated that these 250 cases have been taken consecutively, with only two exceptions. There has been no picking or choosing. Of the two cases omitted one was a beggar boy sent in by the police, suffering from early neural leprosy but dying from multiple tuberculous joint abscesses. The other patient died from pulmonary tuberculosis before a proper history could be obtained.

In view of the fact that primarily lepromatous cases take so important a place in the usual classification of types of leprosy, our experience seems unusual. Among all of our cases there was only one that it seemed even possible to place in this class. This was a youth of 19 whose disease began 11 years previously. His history was unsatisfactory because of the early age at which his illness began; his parents were dead and he himself was a beggar boy of low mental development. According to his statements the disease began with a red eruption over the face followed by numbness of both legs. But there was an interval of six years between the appearance of the

rash on the face and any marked signs of a lepromatous condition such as deformity of ears and commencing collapse of nose. We think, therefore, that we are justified in classifying him as Nt-L.

SUMMARY

We have here recorded an analysis of 250 cases of leprosy in Chinese, as seen in our leprosarium in the Province of Chekiang. With the possible, but unlikely, exception of one, all of these cases began as of the "neural" type. We are struck by the similarity between our findings and those of Ryrie in Chinese patients in Malaya.

We protest against the use of the term "tuberculoid" to cover all cases of "neural" leprosy, as our experience, backed by not a few histological examinations, has shown that many neural cases are not and never have been tuberculoid in the strict meaning of that word.

RESUMEN

Basándose en sus experiencias en el area de Hangchow en Chekiang, con pacientes leprosos cuyo origen también se discute, los autores expresan poca satisfacción con los sistemas de clasificación existentes. Una de las dificultades es que éstos se basan en los hallazgos histológicos, y en muchos sitios tales exámenes no son factibles, aunque los propios autores los hicieron cuando fué necesario. Otra dificultad es que la enfermedad varía mucho entre distintas razas. Aunque comprenden que en la clasificación de la Habana todos los casos neurales caerían dentro de los del tipo tuberculoide, ellos (los autores) no pueden hacer ésto, puesto que muchos de sus casos neurales no eran tuberculoides ni clínica ni histologicamente. Se expresa la opinión que se dá demasiada importancia a la condición lepromatosa primaria en la clasificación, puesto que ninguno de sus 250 casos, con excepción dudosa de uno, fueron de éste tipo. En todos sus casos las lesiones lepromatosas originaron de alguna que otra variedad del tipo neural, ya fuese no-maculo-anestésico (Na), ya simple macular (Ns), o ya tuberculoide (Nt). Sus casos pueden, por lo tonto, ser divididos así: Na (17.6%), Na-L (9.2%), Ns (14.4%), Ns-L (3.6%), Nt (37.6%) y Nt-L (17.6%). Cada una de estos formas es brevemente descrita.

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