ON THE EPIDEMIOLOGY OF LEPROSY IN FRENCH GUIANA*

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Leprosy is known to have existed in French Guiana before 1743 because in that year a local regulation was promulgated to stop the progress of the disease which had already produced dozens of victims among thousands of slaves.

During eight years residence in Cayenne, we have accumulated records of about 1500 cases of leprosy, including many based upon personal observation as we have investigated 730 cases registered since 1939, and have been able to follow a considerable number of them.

The earliest observations available to us were made in 1925. From that year to June 1946, a period of twenty-one years, the names of 1447 persons were listed on the leprosy register, 1194 from the free population and 253 from the penal population. To June 30, 1946, 290 of these are known to have died, and 26 others to have left the Colony. There remain, therefore, in Guiana 1131 which, in an estimated population of 22,000 inhabitants, gives a prevalence rate of 5.1 per cent. It is evident that there are unregistered cases, the maximum number being probably not more than 300. The actual prevalence of the disease in French Guiana would, therefore, be of the order of 6.5 per cent—a much lower figure than is sometimes quoted.

The 253 patients in the penal population were all males; 157 were Europeans, 76 Arabs, 13 Asiatics (Chinese and Indochinese), and 7 of miscellaneous nationalities.

Those in the free population included 1188 Creoles (Guianese and Antillais), 3 Europeans, 2 Senegalese, and 1 Chinese.

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The following is the age and sex distribution of the Creole patients in the free population:

Age and sex distribution:

Age at registration (years)	Male	Female	Total	Per cent
0-5	35	37	72	6.1
6-10	146	107	253	21.3
11-15	110	85	195	16.4
16-25	137	83	220	18.5
26-50	180	110	290	24.4
Over 50	102	56	158	13.3
Total:	710	478	1,188	100.0

The disease is therefore more frequent in males than in the opposite sex, as I have already reported in 1941 (1).

Close attention has been paid to the discovery of early cases in the past seven years, particularly among school children. The proportion of those in the age group 6 to 10 years among newly registered leprosy patients, varied from 21 per cent to 30 per cent yearly with an average of 27 per cent.

Children below 15 years of age represent 49 per cent or half of the new cases, indicating that the endemicity is still progressive or active.

Contagiousness:

This is the most obscure point in the problem of leprosy. The cause of our ignorance is notably the long duration of the period of incubation and this is the reason why, in endemic countries, the source of infection cannot be identified.

The patients often ascribe, without proof, their disease to some element of diet such as fish or game. Transmission by the placental route does not seem to exist. For one thing, we have never observed infants born with signs of leprosy. For another thing in families with several cases of leprosy, it is relatively rare to find the mother and her child or children sick with the disease at the same time. If leprosy were hereditary, as sometimes the Creoles believe it to be (the disease follows the blood, so they say), we would have had many more recorded cases arising from female lepers. We have observed for four years a child who had only fifteen days of contact

with its leprotic mother (who died following delivery) and who, at present, does not show any signs of leprosy.

Familial infection apparently is a proven fact; there are numerous families with multiple cases. Without being able to prove it, it is frequently possible to trace the infection to a previous case in the household, be it parent, friend, or domestic. In our records we have an instance in which a servant apparently infected five infants under her care.

In those cases of probable familial infection which we have been able to investigate, the disease seems to be transmitted to collateral more often than to direct descendants. We have observed the following: *

59	times	2 siblings
16	"	3 "
2	"	4 "
4	"	5 "
16	"	mother and 1 child
5	"	" " 2 children
2	"	" " 3 children
1	"	" " 4 children
14	"	father and 1 child
3	"	" " 2 children
3	"	husband and wife (in one case with 2 children)
1	"	a mother, a daughter, and a granddaughter
1	"	a grandmother and 2 infants
1	"	a grandfather and 1 grandson
14	"	an uncle and one nephew or niece
1	"	an uncle and two nephews or nieces
9	"	2 cousins
2	"	3 cousins

The intervals between the onsets of cases in the same family varied from a few days to fourteen years; the average was three years.

In 65 per cent of infected families, the members presented the same clinical type of leprosy; usually the maculo-anesthetic form with tuberculoid structure.

Contagion among school children is real, and for this reason the infected children are excluded from the schools. The results of this prophylactic method when strictly enforced is encouraging. This

* A statistical approach to this problem will be found in the Internat. J. Leprosy 12, (1944) 79-82. (Acting Editor)

measure is responsible for the progressive diminution of new cases in the schools (26 cases 1939; 17 in 1940; 14 in 1941; 12 in 1942; 1 in 1943; 10 in 1944, and 8 in 1945).

Among children of school age, the forms of leprosy found on discovery are often of the maculo-anesthetic form which are frequent in Guiana. V. Pardo Castello and F. R. Tiant (2) admit with the majority of leprologists that "from the prophylactic point of view, individuals with tuberculoid type are not dangerous." Theze (3) on his part, points out the frequency of macular leprosy in Guiana, and considers it as "a terrible menace in the future." He thought of the risk of their evolution to the lepromatous form, but this transformation appears to be quite rare. Our opinion is midway between the two extremes; we think that these forms are the least dangerous but this appears difficult to prove in the absence of laboratory evidence that they are not contagious.

In adults the contagiousness of leprosy is also indisputable; one irrefutable proof is the presence of numerous cases of leprosy among the prisoners in Guiana, particularly among the Europeans. In general, it is only after a long sojourn in an endemic milieu that the disease is manifested among the latter (average of twenty-one years in 55 cases). Nevertheless, we know of one case in a boy of 10 years of age, son of an official, in whom the diagnosis of leprosy was made after a residence in Guiana of only one-and-a-half years.

When we compare the average elapsed period between the date of arrival in the Colony and time of diagnosis for these non-Creole patients with the average age at which the Creoles develop leprosy and when we note especially the high proportion of children among the Creole patients, we can conclude that the incubation period is much shorter among the latter.

The duration of the incubation period is perhaps related to age at exposure (4). Many of the Creoles are exposed in infancy and infants are generally recognized to be more susceptible to the infection. The duration is also possibly influenced by greater intimacy and frequency of contact among the free population.

On the contrary the frequency of progressive and serious types is much higher among the Europeans than among the indigenous population. This indicates, according to our belief, the presence of a relative immunity among the Creoles, who constitute, in general, a population exposed for a long time to an endemic milieu.

Whatever is the case, it seems that leprosy can determine, as in tuberculosis, an "allergy" bringing with it its complexes of hyper-

sensitivity and partial immunity. The development of the tuberculoid forms probably is attributable to a great degree to a favorable influence of this allergy, which perhaps can be demonstrated by the lepromin reaction of Mitsuda.

This reaction gave positive results in 90 per cent of our tuberculoid cases and in 51 per cent of the neural type. It is always negative (anergy) in the lepromatous type, and only one positive reaction was observed in 12 cases of the mixed forms. In healthy children, we have not found positive reactions under 10 years of age. As we have already seen, the highest percentage of early cases is discovered between the age of 5 and 10 years. Therefore in view of these facts, it seems to us that it would be interesting if in endemic countries young children could by some artificial process be made to develop a positive Mitsuda reaction.

SUMMARY

Leprosy was present in French Guiana before 1793. An active case finding program permits an estimate of 5.1 per cent as the endemic rate.

Not a single case of transplacental infection has been demonstrated. Familial and school infection seem certain.

In adults as well as children the contagiousness of leprosy seems indisputable. This is proven by the numerous cases of leprosy developing in the penal milieu among persons originally from countries practically free from leprosy.

The incubation period seems shorter in the Creole population than in the penal population. On the other hand, the general evolution of the disease is much more benign among the former.

Leprosy, like tuberculosis, probably causes an "allergy" bringing with it a complex of sensitivity and partial immunity, possibly manifested clinically by the appearance of tuberculoid forms. The positivity of the Mitsuda reaction seems to be directly related to this allergy.

Among healthy children, positive Mitsuda reactions have been observed only in children over 10 years of age. Since the highest per cent of new cases are found between the ages of 5 and 10 years, one would think it would be interesting if by some artificial means, in countries where leprosy is highly endemic, small children could be made to react positively to the Mitsuda reaction.

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