Infantile Visceral Leishmaniasis in the Maltese Islands

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B.M.J. Sept. 10, 1955. Vol. 2 p. 654

The main purpose of this paper is to record the decline in the incidence of leishmaniasis in the Maltese Islands over the past eight years, to comment on the literature perused during its preparation, and to review the insecticide residual technique used against the vector. It will also serve as an introduction to a later paper which will deal with epidemiological figures relating to the part played by the sand-fly in transmission of the disease. The clinical picture is not given, as Debono's (1947) description of the illness is not to be improved upon.

Historical Data

Leishmaniasis must have been endemic in these islands for a long time. Its first mention in Maltese medical records was in 1909; however, the figures published by the medical and health authorities in the first 25 years of this century reveal an extraordinarily high incidence of deaths in children under 1 year from chlorosis, anaemia, splenomegaly, splenic anaemia, and leucosplenic anaemia. That most of these cases must in reality have been due to unidentiged kala-azar is shown from the yearly increase in incidence of deaths in children from that disease and the corresponding decline when leishmaniasis became known to have an entity of its own.

The occurrence of splenic anaemia in young Maltese children was first identified with visceral leishmaniasis by A. Critien as early as 1909; a year later he discoverd the disease in the dog—work that was later carried out by V. Mifsud and A. Bernard. However, it was not till 1931 that leishmaniasis began to be investigated thoroughly. Early in that year Dr. S. Adler asked the Government of Malta for facilities to continue the investigations on kala-azar which, with his colleague Theodor, he had been carrying out in Catania the year before. They were trying to establish whether the sand-fly, which their research in Sicily indicated as the most important carrier of the disease, would be found to play here the same part in transmitting the disease. Two years later kala-azar was again mentioned in the principal medical officer's report, which dealt extensively with the first International Congress of Mediterranean Hygiene, held in Marseilles in the same year. It is therefore rather strange that leishmaniasis as a cause of death does not figure before the year 1938, when it was bracketed with "other diseased due to protozoa."

In 1946, on my return from postgraduate training in the United Kingdom, leishmaniasis was, at my suggestion, made notifiable for the purpose not only of collecting full data on the epidemiology of the disease but also of starting a campaign against the vector by the insecticide residual technique. Mention should here be made of Dr. Francis Jaccarini, of Senglea, who was the first doctor in Malta to diagnose leishmaniasis in the adult.

Incidence

One peculiar characteristic of the clinical manifestation of the disease in comparison with other countries in the Mediterranean area is that we never encounter the cutaneous type—yet in Italy that type seems to occur quite often. (Table I). It is not a question of the cases being missed, as intensive reesarch some 17 years ago for the express purpose of identifying the cutaneous lesion proved unfruitful.

Figures prior to 1947 are scanty and fragmentary, and do not in any way reflect

the actual incidence of the disease; figures for 1946 are not taken into account, as only those for the last trimester of the year are available.

The total number of cases in Malta during 1947-55, inclusive, was 803 (397 males, 406 females).

Age at Onset.—Two points are worthy of note: (1) leishmaniasis in the adult is rare and the visceral form affects children mainly; and (2) the commonest age group is from 2 to 3 years (Table II).

TABLE I.

	1950		1951	
	Visceral	Cutaneous	Visceral	Cutaneous
Italy	61	1,879	76	1,350
Malta	66	0	58	0

TABLE II. — *Age Grouping* (*Malta*, 1947-55).

Age in years	—1	—2	—8	—4	—5	—10	—10+
No of cases	49	201	268	146	64	64	11

TABLE III. — *Monthly Incidence* (*Malta*, 1947-55).

	1947	1948	1949	1950	1952	1952	1953	1954	1955	Total
January	1	11	6	8	0	3	5	4	1	39
February	8	24	9	1	4	4	3	2	5	60
March	21	20	8	8	3	3	7	4	0	74
April	19	16	12	6	3	10	7	5	3	81
May	12	27	10	8	5	5	5	2	2	76
June	22	27	7	4	4	6	7	7	2	86
July	17	17	13	7	8	2	5	5	3	77
August	15	20	9	4	6	4	4	1	2	65
September	29	12	2	7	8	7	5	7	2	79
October	27	18	6	4	5	5	7	7	0	79
November	12	10	3	2	7	3	4	1	2	44
December	8	2	6	7	5	3	4	4	4	43
Total	191	204	91	66	58	55	63	49	26	803

The yearly and the monthly incidences are shown in Table III. There was a striking drop in 1949, with a gradual reduction in the following years. This table may be somewhat misleading, as the day of notification of the illness does not correspond to the actual onset of the disease.

Results

The success of the treatment is reflected in the mortality rate (Table IV). Although the treatment is painful and complications and sequelae occur, leishmaniasis is not now regarded as such a serious problem. The figures in Table IV compare well

TABLE IV.—DEATHS

TABLE IV. — *Deaths.*

	1947	1948	1949	1950	1951	1952	1953	1954	1955	Total
No. of death	12	9	3	1	3	0	1	0	0	29

the mortality rate for those who completed the whole course was 26%. The sudden drop in the number of cases in 1949 and with those for 1923-32, when treatment was successful in only 59% of cases and the falling incidence since then compel one to believe that these results are due mainly to the spraying of premises where cases were notified, using the D.D.T. residual technique. This opinion is shared by Dr. E. Stilon and Dr. P. Borg Mallia. Sanitation, of course, has not been neglected,

and the eradication of breeding places of the vector has been carried out in earnest. It is worth while mentioning here that the vector breeds also in the decayed stems of the prickly pear (*Opuntia vulgaris*), and is found, too, in the empty shells of molluses, chiefly *Helix*, both of which are present in great abundance in Malta.

Discussion

Historically, the first attempt to reduce the number of sand-flies in Malta came from Captain J. P. Marett, R.A.M.C., in 1910; but his concern was to reduce sand-fly fever. On the other hand, the first attempt to eradicate leishmaniasis in these islands through an insecticide was made in 1912 by Dr. A. Critien, who, however, in advising parents to spray the floors with an insecticide, mistook his target, as his efforts were directed against *Pulex irritans* and *Pulex serraticeps*. When I first suggested the present treatment I was quite aware that Malone and Brooks (1944) had cast doubt on the part said to be played by the sand-fly as the vector. However, strong enough evidence has not been brought by the advocates of this view, and in the Mediterranean area the work of Adler and Theodor (1935) still holds good. Nor is this challenge new. In fact, the contention that the phlebotomus is not the only vector was raised in the Congress of Mediterranean Hygiene held in Marseilles in 1932, when several observers suggested that in mountainous areas not known to be sand-fly infested another insect vector should be looked for.

In these islands, the campaign, which was launched towards the end of 1946, is entirely in the hands of the medical and health entomologist, Dr. P. Borg Mallia. Disinfestation with D.D.T. is carried out in all bedrooms, etc., as soon as a case of leishmaniasis is reported to him by the medical officers of health. After a month a second spray of D.D.T. is given. As our walls are made of coralline limestone, we did not feel the need for previously spraying them with phosphate solution to prevent the D.D.T. from forming chemical complexes with ferric ions and thus reducing its insecticidal power. Nor did we spray the animal reservoir. We are satisfied with the scheme, and are hopeful that leishmaniasis in Malta will soon be a very rare condition.

The only hazard of the scheme for human beings lies in the accidental swallowing of the insecticide by children—a thing which, to my knowledge, has happened only once.

Another type of danger, and to my mind the only serious one, is in the resistance that the vector may develop to the insecticide and in the acquisition of tolerance not only to the chemical at present used but also to allied ones. In fact, it is known that strains may become resistant to an insecticide; for D.D.T.-resistant fly populations have developed already in the Middle East. A further disadvantage lies in the repellent action that the D.D.T. or its diluent may have on the vector, which may be stimulated to fly before contact is made with D.D.T. or a toxic dose has been acquired by it, thus, by putting the vector to flight, opening up new foci of infection. So far there is no evidence of either of these dangers, and one hopes that the disease will be eradicated before resistance developes.

Summary

Leishmaniasis is endemic in the Maltese islands. The cutaneous form is unknown; the visceral type affects children mainly between 1 and 3 years of age.

Since the end of 1946 disinfestation with D.D.T. has been carried out in all premises where leishmaniasis has been reported. The sudden drop in the number of cases in 1949 and the falling incidence since then appear to be due to the D.D.T. residual technique. The dangers that this scheme may entail are discussed. The treatment given has been successful, and the disease is now not such a serious problem.