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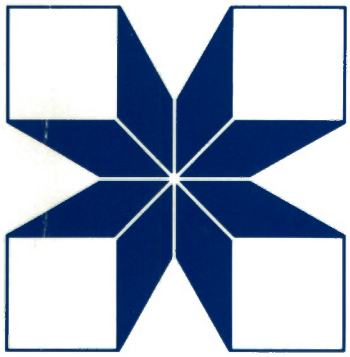

CANADA

ZOONOTIC AND PARASITIC DISEASES

PROCEEDINGS OF THE THIRD INTERNATIONAL AND PAN-ARAB SEMINAR HELD IN AMMAN, JORDAN, 17–20 OCTOBER, 1989

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ZOONOTIC AND PARASITIC DISEASES

Proceedings of the Third International and Pan-Arab Seminar held in Amman, Jordan, 17-20 October 1989

Edited by
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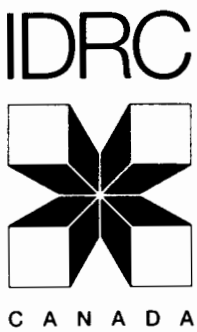

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EPIDEMIOLOGICAL FACTS ON KALA-AZAR (VISCERAL LEISHMANIASIS) IN IRAQ

Amjad D., Niazi*, Suad Z. Jawdat, Layla Kh. Rifaat** and Hana S. Ali****

Visceral leishmaniasis (VL), in which the parasites affect the internal organs (spleen, liver, bone marrow, etc.), is usually fatal if untreated (1). It is endemic in several parts of Africa, the Indian subcontinent and Latin America, and occurs sporadically in China, the Mediterranean Basin, South West Asia and southern parts of the Soviet Union (1).

In Iraq VL is regarded as an endemic disease. The first report on the disease was recorded in 1916. Several hundred cases of VL are reported in Iraq annually (3). The incidence of the disease is higher in the central provinces than in the south or in the north (4, 5, 6, 7 and 8).

The present investigation was designed to detect magnitude of exposure to the infection and to find different types of reaction to it.

Materials and Methods

The present work depends on some particular parameters.

1) Charts and case sheets

Charts and case sheets were designed and used to collect data from hospitals and houses. There were three teams, one visiting the hospitals, another visiting the patients homes, and a third performing the laboratory work.

Information was collected from the hospital in regard to name, sex, sequence of the child in the family, weight, parent background, time lapse between beginning of symptoms and admission to hospital, signs and symptoms, clinical examination and blood sampling, treatment outcome; and from the home, level of income, particulars

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regarding children, age of mother and blood sampling of all those previously mentioned (Tables 1, 2 and 3). Another 100 control blood samples were collected from school children far away from the endemic area (Baghdad city, Al-Karrada) and processed in an identical way.

2) Home visits

The team that homes related certain criteria to such categories as levels of income, literacy of either or both parents, occupation of father, type of dwelling and crowding index, and estimated income of the family.

The homes of 57 sick children were visited and blood samples were taken from the sick children, their sisters and brothers of the same age group, and children of relatives and neighbours.

3) Enzyme Linked Immunosorbent Assay (ELISA)

The indirect method of the micro-ELISA was followed as described by Niazi (7), using L. donovani (BRCI) soluble antigen extract. The antigen was used for coating the ELISA micro-titer plates at a protein concentration of 10 μg/ml. Titration was done with known controls, both positives and negatives, and took the 0.3 reading as a cut point for positives; micro-ELISA values were obtained by micro-ELISA minireader MR (Dynatech product) at 490 nm.

4) Indirect Fluorescent Antibody Test (IFAT)

This was performed on individuals with suspected cases using L. donovani as the antigen, and was done by the Institute of Endemic Disease, Kala-azar Section.

5) Diagnosis

Criteria have been used to diagnose a case of Kala-azar on clinical, serological, and whenever possible on bone-marrow basis.

6) Tri-coloured arm strip

A method of measuring the arm, which called for a tri-coloured arm strip (9), was used to determine under-nutrition in studied cases.

In addition, weighing scales were used to weigh every sick child and compare the weight and age to the standards mentioned in the growth start adapted by the Maternal and child Health Clinics (9).

Results

From the analysis of the data collected after tabulation (Tables 1 and 3), the information was collected from 238 hospitalized cases of kala-azar; 57 houses were visited and the other children of the same family examined. Children of close relatives and children of neighbours (307 in all) and 37 mothers were also examined.

From (Table 1), it is clear that the situation had not changed much of the previous picture of the disease.

It seams from the present work that the high fatality is among a small and narrow group of children which show severe clinical forms of the disease, especially those cases in which we found a long time lag between suffering and admission to hospital (where delayed hypersensitivity reaction did not develop) or those showing recurring signs for the same reason.

Geographical distribution of cases

We found that all the cases came from the known foci of the disease.

Weight of children

Adapting the growth chart it was found that 33.8% of children admitted to hospitals were below average normal standard, 60.6% were within the range of normal weight, and only 5.6% were above range (Total: 216).

Sequence of birth in the family

It was found that generally less than 205 (19.4%) were the first born, and about 65% were the third or more, as shown in Table 2.

Feeding

It was found that, among 183 cases, 45 (29.5%) children were artificially fed and 129 (69.3%) were breast fed.

Table 1. Distribution of 238 cases studied according to sex and age

Age in years	Sex male	Sex female	Total	% to Total
< 1	60	58	118	49.6
1 < 2	44	38	82	34.9
2 < 3	8	11	19	7.98
3 < 4	4	2	6	2.5
4 < 5	--	2	2	0.8
5 < 6	2	1	3	1.25
6 < 7	--	--	--	--
7 < 8	2	1	3	1.25
8 < 9	1	--	1	0.4
9 < 10	1	--	1	0.4
10 < 11	--	1	1	0.4
11 < 12	1	1	2	0.8
Total	123	115	238	
%	51.6%	48.4%		

Table 2. Sequence of birth of the child among the children of the family

Sequence of the child	Number	Percent
1	44	19.4
2	39	17.2
3	35	15.4
4	20	8.8
5	21	9.3
6	18	7.9
7	18	7.9
8	10	4.4
9	12	5.3
10	3	1.3
11	2	0.9
12	4	1.8
15	1	0.45
	227	

Background of the family

174 (73.4%) out of 238 cases of kala-azar were born to illiterate.

Time lapse between feeling and showing signs and symptoms and reporting to hospitals as ill in 224 cases was studied. The time ranged from one day to nine months with a mean of 37.2 days. This was considered a long time compared to admissions of other diseases. This of course depends on the well known variation in the severity of the signs and symptoms.

Among 187 cases examined by ELISA and IFAT it was found that 146 (78.1%) gave both positive results or gave both negative results and only 41 (21.9%) was there disagreement either way.

With regard to ELISA, bone marrow smear or culture positively, it was found that, among 45 cases examined, 39 (86.7%) showed agreement in the results, and only 6 (13.3%) gave negative results. Of 207 cases 193 (93.2%) were found to be ELISA positive and only 14 (6.8%) were found negative by ELISA.

Of 213 cases, 161 (75.6%) were found IFAT positive and 52 (24.4%) were found IFAT negative.

According to the present criteria we found that 54 (94.5%) of the families of sick children visited at their houses were of medium socio-economic level.

Three hundred and seven blood samples were collected including those from the sick children (250 excluding the sick). Of those 250 samples, 8 (3.2%) were previous cases of kala-azar and they were still positives, while 4 (1.6%) were previously infected with kala-azar but were now negative. Sixty-three (25.2%) were positive but did not show any signs or symptoms. Prevalence of positivity among all children during time of visits are shown in (Table 3).

Forty-one point six per cent (41.6%) of children were therefore positive during the visit, i.e., about half of the children were positive all the year around, both in number and in titre, and age distribution was similar to the recorded cases.

Of the mothers of the 57 cases visited at their houses, 37 had blood samples taken. Twenty-one (56.8%) were found to be positive and only 16 (43.2%) were found to be negative.

All of 100 blood samples collected from the non-endemic areas were serologically negative.

Table 3. Particulars of children examined during house visits

	No.	%
Cases	57	18.6
Previous cases still positive	8	2.6
Previous cases now negative	4	1.3
Symptomless cases	63	20.5
Negative children	175	57
Total	307	

Discussion

Distribution of cases according to age was found, 495 being under one year of age, and 96% under 5 years of age. These results were in agreement with the Sukker report (3). The same is true of the asymptomatic cases, which confirms the view of early high exposure of the children to the disease, differing only in that the manifestation of the signs and symptoms and admission to the hospital by a small number took some time, according to the severity of the disease. Those cases constitute the confirmed cases of kala-azar which represent only 44.5% of the positive sero reactors among the delimited age group of children in those communities. Moreover, about 41.6% of all the children examined during the visits were positive (including the cases). It means that seropositivity is present at any time of the year, both in titre as mentioned by Jawdat et al. (8), and in number greatly exceeding those reported to the hospitals; and that those cases reported to the hospital represent a small number of the positive cases where signs and symptoms develop, since for some reason or another the delayed hypersensitivity and the cellular immunity which mark the cure of the cases takes a longer time to appear in these cases.

Among the seropositive children, both sick and asymptomatic, a high percentage (30%) were found to be artificially fed, and 34% were found to be below normal average standard weights. As for the sequence of the child in the family, 65% were recorded as the third child or later. This could explain nutritional factors that may affect the course of the disease. This is closely related to the critical age of the child nutritionally, especially with ignorant and illiterate mothers (73.4%).

Conclusions

The work which has been done has led us to conclude the following points, which we think are important in the diagnosis, epidemiology and control of the disease.

1. It was found that the ELISA technique used in diagnosing the cases was more sensitive than IFAT.

2. The children in affected areas and foci are exposed to the disease early in their life.

3. Not all the children infected report to the hospitals.

4. A high number of positivity is present among the children at any time of the year.

5. A high percentage of sick children (both symptomatic and asymptomatic) were found to be artificially fed, and below normal average standard weights.

6. A very high percentage 73.4% of the all positives have illiterate mothers.

7. The preceding factors, plus the fact that the children highly affected belong to the critical age group nutritionally speaking, in relation to weaning and the beginning of self feeding constitute the main reasons for the distribution of the cases according to age.

Acknowledgments

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