

Seroepidemiology Study Of Visceral Leishmaniasis Among Human In Azarshahr Areas, East Azerbaijan, Islamic Republic Of Iran

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Citation

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Abstract

Objectives: This study was carried out in order to determine visceral leishmaniasis in Azarshahr, East Azerbaijan province, during 2009-2010. The study was descriptive (cross-sectioned) and multi stage sampling has been performed from 10 % of children <10 years old with filter paper methods. **Material and Methods:** 1500 blood specimens were collected to detect anti-leishmania antibodies. The samples were tested by serological procedures included: indirect fluorescence antibody test (IFAT), and direct agglutination test (DAT). **Results:** Results showed that, by DAT test 19 (1.3%) of the collected specimens were anti-leishmania antibody positive with $\geq 1:3200$ titers and 32 (2.2%) with 1:1600 titers suspicious. **Discussion:** Regarding the findings we recommend that further studies are necessary for isolation and specification of leishmania parasite and determination of the animal reservoir as well as the species of sandfly vectors in this region. This study in comparison with other investigations indicated that visceral leishmaniasis is endemic in Azarshahr district.

INTRODUCTION

From a worldwide public health point of view zoonotic visceral leishmaniasis (ZVL) is one of the most important parasitic disease emerging in recent years (WHO, 1990). Visceral leishmaniasis (VL) or kala azar is an endemic disease in parts of Iran, in some areas of Fars province in south and in Ardabil and East Azerbaijan in north-west (Edrissian GH, et al 1988). In East-Azerbaijan province a high number of cases of kala azar were recorded during the last decade, which indicates that VL is endemic in some areas of this province. The study was carried out in Azarshahr during 2000-2001 showed that, by direct agglutination test (DAT), 1.9% of the collected specimens (1252 blood specimens) were anti-leishmania antibody positive with $\geq 1:3200$ titers and 1.2% with 1:1600 titers were suspicious (Misamadi N, et al 2003). This study was carried out during 2009-2010 in the villages of Azarshahr area of East-Azerbaijan province. The aim was to determine the seroprevalence of VL in the area.

MATERIAL AND METHODS

The study area is situated in the south-east of Uromieh sea and has 50 Km distance from Tabriz city, at an altitude 1367 meters. The investigation was carried out over a period

of 12 months from September 2009 to October 2010 on the residents of 15 villages and 15 area of Azarshahr city. The study was descriptive (cross-sectional) and plasma samples were collected in heparinized capillary tubes from 10% of children ≤ 10 years old. Altogether, 1500 blood specimens were collected to detect anti-leishmania antibodies. These samples were tested in the protozoology laboratory, faculty of medicine, Tabriz university of medical sciences by direct agglutination test (DAT) according to the methods described by Harith et al that prepared in the Protozoology Unit of the faculty of medicine in Tabriz university of medical sciences (Harith A et al, 1988; Harith A et al, 1989). The principal phases of the procedure for making DAT antigen were mass production of promastigotes of leishmania in the RPMI 1640 + fetal bovine serum, trypsinization of the parasites, staining with coomassie blue and fixing with formaldehyde. For making local DAT antigen, Leishmania donovani strain I-S kindly provided by Dr. AE Harith, that exist in protozoology unit, Faculty of Medicine in Tabriz university of medical sciences, was maintained in the NNN medium enriched with LIT liquid phase (Ss digursky M, Brodeskeym CT, 1986) and used in our laboratory.

RESULTS

Of the 1500 plasma samples prepared from children 19 cases (1.3%) showed anti-leishmania antibodies in titres of 1:3200 by DAT (Table 1). All the cases were children under 10 years. The highest proportion of positive cases was in children <1 years old and the rate among children decreased with age. A number of seropositive cases (8) were found among children with no previous history of kala azar. About 1.3% of the seropositive individuals were males and 1.2% females, giving a male to female ratio of 1.02:1.

The geometric mean reciprocal titre (GMRT) in females (15848.9) was much higher than in males (5214.8). The patients were diagnosed clinically with kala azar. All of them were under 9 years old and 8(80%) were under 4 years. All of them were seropositive with DAT analysis (titres $\geq 1:3200$). Fever (36% of cases) and splenomegaly (42.1%) were the most common signs and symptoms.

Figure 1

Table 1: Results of direct agglutination tests (DAT) from 1500 plasma samples by age in Azarshahr area, northwest of Iran

Distribution Centers	Number of Positive Calves	Total Calves Tested	Prevalence (%)
Of Saghez County			
Medium scale dairy (No.=5)	25	212	11.8
Small scale dairy (No.=20)	10	200	5
Total	35	412	8.5

Figure 2

Table 2: Results of direct agglutination tests from 1500 plasma samples by sex

Age range	No. Studied	Cryptosporidium	
		No. Infected	%
< 1.5 months	44	18	41
1.5 – 3 months	87	7	8
3 – 8 months	96	5	5
Adults	185	5	3
Total	412	35	8.5

DISCUSSION

In this study, serological surveys using DAT analysis showed 1.9 % of the population in the study areas had anti

–Leishmania antibodies in titres of $>1:3200$, all of them children under 10 years old. A number of seropositive cases were found among children with no previous history of kala azar. The peak number of cases was in children < 1 years old and the seropositive rate decreased with increasing of age of the children. Prior studies in the Islamic Republic of Iran have shown a seropositive rate of about 50% in the age group 1-2 years and 96% of seropositive cases in children up to 8 years old [1-3].

About 1.3% of seropositive individuals were males and 1.2% females. No statistically different ($P < 0.05$) was observed between them.

Cross-sectional IFA and DAT serological survey of VL in endemic foci of the Islamic Republic of Iran showed that females are exposed and became infected at least as much as males.

However subclinical form of the disease may be more common in females than males.

In some rural areas the rate of active kala azar cases in males may be higher than females [8].

Therefore, it does not seem that VL affects males more than females, at least in the Azarshahr areas studied. However, the GMRT in females (15848.9) was very much higher than in males (5214.8).

Out of 19 diagnosed cases of kala azar four here, 68.4% were children less than 5 years old and all of them were under 10 years. All of them were seropositive ($> 1: 3200$) by DAT.

Fever and splenomegaly were the predominant clinical features. These signs and symptoms are same as those found in other clinical studies [2].

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