

Prevalence of Leishmaniasis (Cutaneous and Visceral) in Basrah Province between 2013 and 2018

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ABSTRACT

Leishmaniasis in both its forms, cutaneous and visceral, is endemic in Basrah province. The current study aims to estimate the prevalence of infection with leishmaniasis (cutaneous and visceral) in Basrah province in Iraq between 2013 and 2018. The current study is retrospective, using the available surveillance database provided by Communicable Disease Control Centre (CDC) in Basrah, Iraq, for the six years between 2013 and 2018. Cutaneous leishmaniasis has been found to be more prevalent than visceral leishmaniasis, with males at more risk of infected either of the forms than females. The 15 – 45 age group showed the most significant number of cases of cutaneous leishmaniasis, while visceral leishmaniasis was reported for individuals under 15 years old. Rural districts with large agricultural areas reported the highest number of cases of both forms. The majority of cases for both was reported in winter. A rural environment, and inadequate health care and sanitation, was found to increase the incidence of leishmaniasis in Basrah.

Keywords: Basrah; Cutaneous; Leishmaniasis; Prevalence; Visceral.

INTRODUCTION

Leishmaniasis, as a zootonic disease, occurs as a result of infection with intramacrophage unicellular parasitic agents (1). These pathogenic agents belonging to the genus *Leishmania* (2), where human infection with leishmaniasis as an arthropod–born disease may be caused by one of 20 well-known species of *Leishmania* (3). There are three general types of leishmaniasis as a disease: cutaneous, mucocutaneous and visceral (4). They are transmitted by the bite of infected phlebotomine female sand flies(5). Leishmaniasis is a global health problem (6, 7), and in spite of proving various control programmes in a large number of countries to prevent increased leishmaniasis infection, the disease is still widespread (7). *Leishmania* disease in Iraq is epidemic (8) and endemic (8, 9), with the most common form in the country being cutaneous leishmaniasis, as caused by two species, *L. tropica* and *L. major*, as well as visceral leishmaniasis, which is caused by *L. donovani* (10). It is believed that most of the cutaneous leishmaniasis in Iraq is caused by *L. major*, with *Phlebotomus papatasi* being the vector of this form of the disease. It is somewhat widespread in Iraq, but it is rarely reported in the three provinces located northeast of the country. The majority of visceral leishmaniasis cases were reported in central Iraq, particularly the Baghdad area, with *p. alexandri* being the vector for visceral leishmaniasis in the country. Visceral leishmaniasis was rarely found in Basrah, Missan

or Thi Qar before Gulf War, since when it has become widespread in these same provinces (11). The current study aims to estimate the prevalence of infection with cutaneous and visceral leishmaniasis in Basrah province in Iraq for the six years between 2013 and 2018.

MATERIAL AND METHODS

The current study depends on an available database held by the Communicable Disease Control Centre (CDC) in Basrah, Iraq, from 2013 to 2018. This database shows the numbers of patients who became infected with cutaneous or visceral leishmaniasis for six years. The data is classified in terms of sex, age group, area and the month of the year. The incidence of both infections was calculated for the six years and statistically analysed via a chi-squared test.

RESULTS AND DISCUSSION

The available database shows the records of both cutaneous and visceral leishmaniasis in Basrah province; cutaneous leishmaniasis was common (514 cases) compared with visceral leishmaniasis (42 cases) ($P < 0.01$). The incidence of infection with cutaneous leishmaniasis was increased from 1.07 per 100,000 in 2013 to 4.93 and 4.90 in 2015 and 2016, respectively, and then declined to 2.75 per 100.000 in 2017 then increase to 3.54 in 2018, as shown in Fig. (1). Fig. (2) illustrates the incidence of visceral leishmaniasis, which decreased from 0.1 per 100.000 in 2013 to 0.06 per 100.000 in 2017, rising again to 0.1 in 2018 with no significant differences between

years for either cutaneous or visceral leishmaniasis ($P < 0.01$).

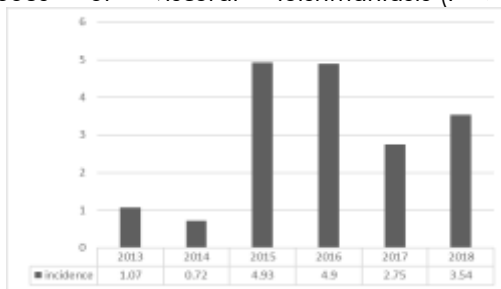


Fig.1: Incidence of Cutaneous Leishmaniasis in Basrah province between 2013 and 2018.

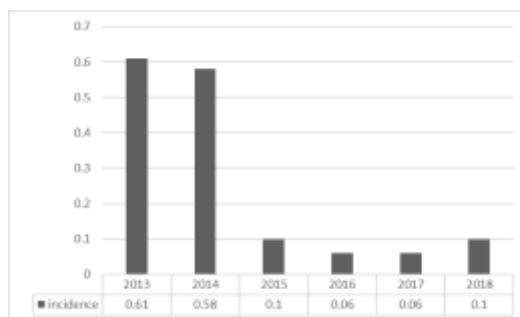


Fig.2: Incidence of Visceral Leishmaniasis in Basrah province between 2013 and 2018.

There was a predominance of *Phlebotomus papatasi* over *P. alexandri* in Basrah province (12), which explains a higher prevalence of cutaneous leishmaniasis, as transmitted by *P. papatasi*, over visceral leishmaniasis, as transmitted by *P. alexandri*. This increase in cutaneous leishmaniasis and decrease in visceral leishmaniasis is thought to be due to the presence of a national leishmaniasis control programme that has been in place since 1970 for visceral

leishmaniasis, but not cutaneous leishmaniasis (11). The total number of infections with cutaneous leishmaniasis in males (408 cases) was significantly higher than in females (106 cases) ($P < 0.01$), as per fig. (3). For visceral leishmaniasis, there was a little increase in the total number of male infections (22 cases) over that of females (20 cases), with no significant differences between them ($P < 0.01$) Fig. (4).

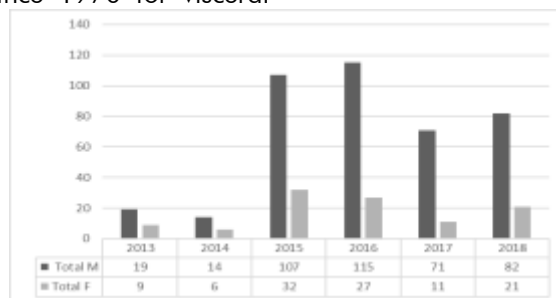


Fig.3: Number of male (M) and female (F) cases of Cutaneous Leishmaniasis in Basrah province between 2013 and 2018.

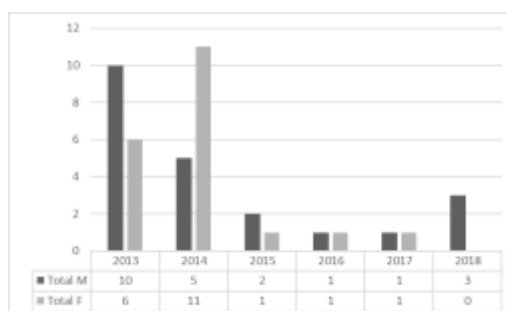


Fig.4: Number of male (M) and female (F) cases of Visceral Leishmaniasis in Basrah province between 2013 and 2018.

The high prevalence of male infections may be a result of high exposure of men to sand flies during outdoor activities (13, 14). Also, sex hormone levels may increase the sensitivity of males to some parasitic diseases (8, 15). The size of the population understudies may affect the incidence of infection in both males and females (16). A significant prevalence of infection with cutaneous leishmaniasis was reported in the 15 – 45 age group ($P < 0.01$) in both males (275 cases) and females (54 cases), as per fig. (5). Since people in this age group are more involved in outdoor activities, most of whom go to school and work outside, they are more exposed to sand fly bites (8). All visceral leishmaniasis cases were

aged under 15 years old, with the majority of cases being reported in the less than one year-old age group amongst females (10 cases) and in the 1 – 4 year-old age group for males (11 cases), with no significant differences ($P < 0.01$) between males and females, as per fig. (6). The particular prevalence of visceral leishmaniasis in children under 5 years-old may be the result of malnutrition (10). A significant number of the cases of cutaneous leishmaniasis were reported in Al-Midaina district (172 cases) ($P < 0.01$) six years ago, as per fig. (7), while Al-Qurna district had the highest number of cases (23 cases) ($P < 0.01$) of visceral leishmaniasis, as per Fig. (8).

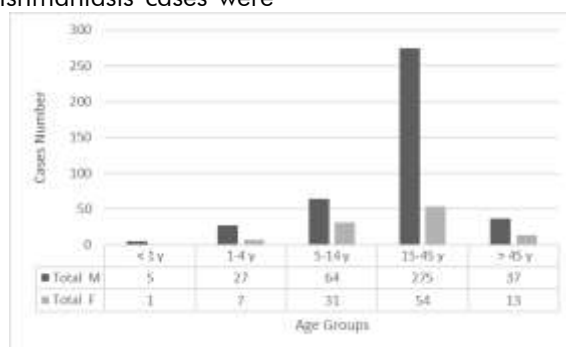


Fig.5: Number of Cutaneous Leishmaniasis cases according to age group between 2013 and 2018, M = Male, F = Female.

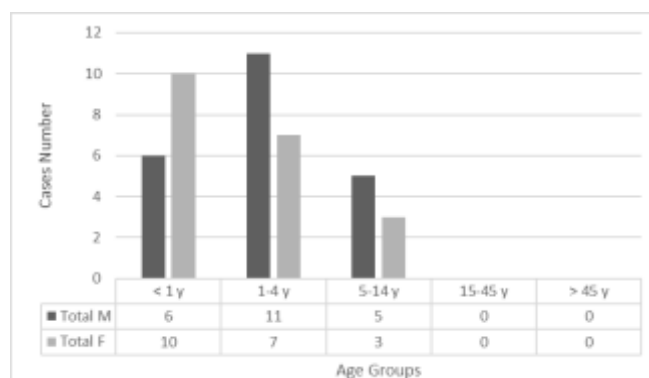


Fig.6 Number of Visceral Leishmaniasis cases according to age group between 2013 and 2018, M = male, F = female.

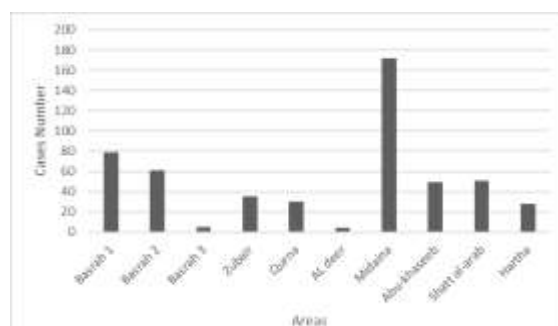


Fig.7: Geographical distribution of Cutaneous Leishmaniasis in Basrah province between 2013 and 2018.

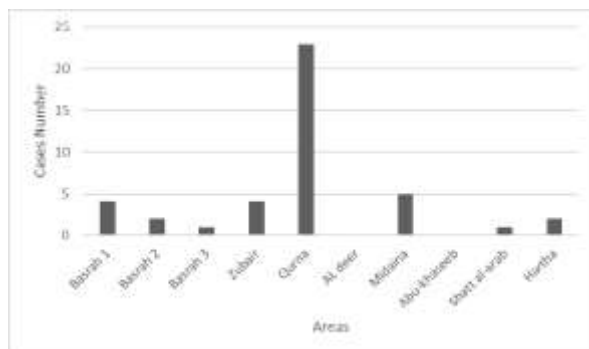


Fig.8: Geographical distribution of Visceral Leishmaniasis in Basrah province between 2013 and 2018.

Both Al-Midaina and Al-Qurna are rural districts, large areas of which are devoted to agricultural use, where houses are built of clay, and there is high humidity and a hot climate; all of these conditions provide ideal habitats for the spread of sand flies and where a large proportion of the population are exposed to the vector (8). Also, inadequate health care and sanitation, as well as the migration of non-immunized people to endemic locations, increases the prevalence of infection by leishmaniasis (6). Monthly cases of

cutaneous leishmaniasis infection were reported in all months of these years, but they were significantly ($P < 0.01$) increased in January (113 cases) and February (111 cases), with the lowest number occurring in August (3 cases), as per fig. (9). For visceral leishmaniasis, the highest number of cases was found in February (7 cases), and the lowest in December (1 case) with no significant differences at 12 months ($P < 0.01$), as per fig. (10).

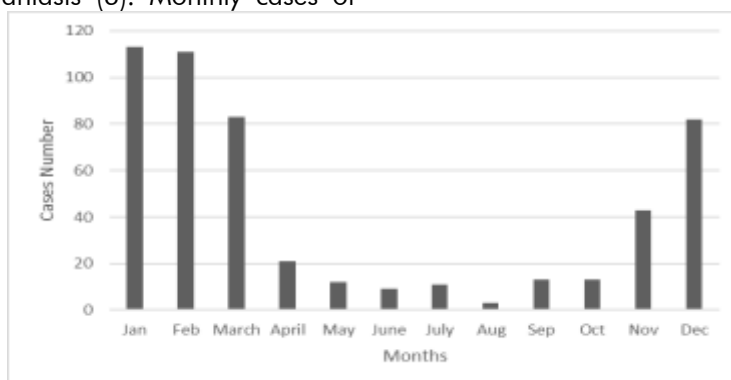


Fig.9: Seasonal distribution of Cutaneous Leishmaniasis in Basrah province between 2013 and 2018.

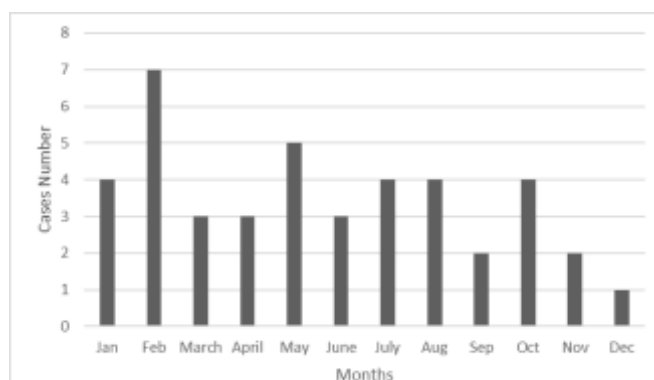


Fig.10: Seasonal distribution of Visceral Leishmaniasis in Basrah province between 2013 and 2018.

Blood requirements and maturation of phlebotomen females and the presence of different reservoir species, as dominant in the

study areas, may explain the variation of seasonal distribution of both cutaneous and visceral leishmaniasis in Basrah (17).

CONCLUSION

The dominance of the vector, weak control programmes, inadequate health care and poor sanitary conditions were the main reasons for the presence and spread of leishmaniasis in both forms, cutaneous and visceral, in Basrah province.

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