

## The prevalence of Cutaneous leishmaniasis in Babil province and some of its affiliated districts

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### Abstract :

Cutaneous leishmaniasis is an endemic disease in many regions of Iraq and the number of cases of cutaneous leishmaniasis has increased in the last ten years.

The study included conducting spread of the disease in some districts of Babil Governorate, which includes Al-Hilla District, Al-Mahaweel District, Al-Musayyib District and Al-Hashimiah District for the period from January 2019 to January 2020 where the cases recorded in laboratory records were approved, in which the results of the clinical examination of the injured were confirmed From the Babylon Health Department / Department of Common Zoonoses in Al-Hilla District - Al-Bakrli District, and their information was written down. The results of the current study showed that the incidence of cutaneous leishmaniasis changes according to the residential area, where the highest rate of infection was in the Hashemite district, as the number of infected people reached 70, and a percentage of 38.7%, while the lowest infection in Al-Musayyib district was 17 injuries, at a rate of 23.8%, with a clear significant difference at the probability level  $p \leq 0.001$ .

The results of the study also showed a clear significant difference at the probability level  $p \leq 0.001$  between the infection rate for males and females, as the number of infected males was 114 by 73.5%, while the number of infected females was 41 by 26.4%. The current results showed an increase in cases of infection in rural areas by 93 And by 60%, while the patients were 62 in urban areas, and by 40%.

The highest cases of infection were recorded during the month of December, reaching 57, or 36.77%, and the lowest patients in June were 2 patients, and by 1.29%, with clear moral differences at the probability level of  $p \leq 0.001$ , while no patients were recorded in July and August and when the injuries were distributed among the groups The age group had the largest share of patients among children under 10 years of age, reaching 45 with an infection rate of 29.3%, followed by the age group (12-30) years with 39 patients with a rate of 25.16%, while the lowest patients was recorded in the age group (>71) with three injuries with a rate of 1.94 The incidence of patients decreased with age. As for the relationship between cutaneous leishmaniasis and the presence of the carrier, it appeared that the highest rate of infection was among patients who were present in their homes, reaching 102 (65.8%), while the lowest infections were few among the infected people whose homes were free of the carrier, reaching 53 (34.2. %).

**Keywords.** *Leishmania*, Babil , Iraq, endemic disease.

## INTRODUCTION:

Cutaneous leishmaniasis is one of the old and endemic diseases in Iraq, where it was known as the Baghdad boil or the eastern boil. The disease is also endemic in neighboring countries, including Syria, Iran, Saudi Arabia, and other countries, including Algeria, Afghanistan, Pakistan, Peru, and Brazil (WHO, 2016).

The World Health Organization announced through its statistics that the distribution of infections has included 98 countries and estimated the number of people infected with the disease to be approximately 12 million infected. It also indicated that the number of people at risk of contracting this disease is 350 million worldwide, with one and a half million new cases expected each year (Khazaei *et al.*, 2015; Alvar *et al.*, 2012). The disease is caused by protozoan parasites of the genus *Leishmania*, and about 20 strains of *Leishmania* are known to infect humans (Markle and Makhoul, 2004).

The life cycle of the parasite is represented by two stages, one of which is the promastigote stage, which is present in the intestines of the sand fly insect (invertebrate host), the vector, and the second stage is the amastigote, which is found in the retinal endothelial system of the vertebrate host represented by humans and other mammals (Duque and Descoteaux, 2015).

In Iraq, there are two types of *Leishmania* parasite that cause cutaneous leishmaniasis, *Leishmania major*, which causes dry sores, and *Leishmania tropica*, which causes wet sores (Ali *et al.*, 2015), where the parasite is transmitted by the bite of a female sand fly (Hermes) while eating its meal of the blood of the host through the skin, and the disease is transmitted to humans or storage hosts such as rodents and dogs (Vidyashankar, 2011), these ulcers are either single or multiple, as cutaneous leishmaniasis takes a long time to heal from two to six months, leaving an undesirable permanent effect and scars in terms of external appearance, especially if the infection is in exposed places of the body such as the face, arms, and legs (Schonian *et al.*, 2000).

Because of the spread of the disease and a large number of infections in Babil Governorate, this study was conducted to investigate the causes of the spread of the disease in Babil Governorate and some of its sub-districts by knowing the relationship between infection with cutaneous leishmaniasis and its distribution according to the region of residence, sex, age, months of the year and the presence of the sand fly vector.

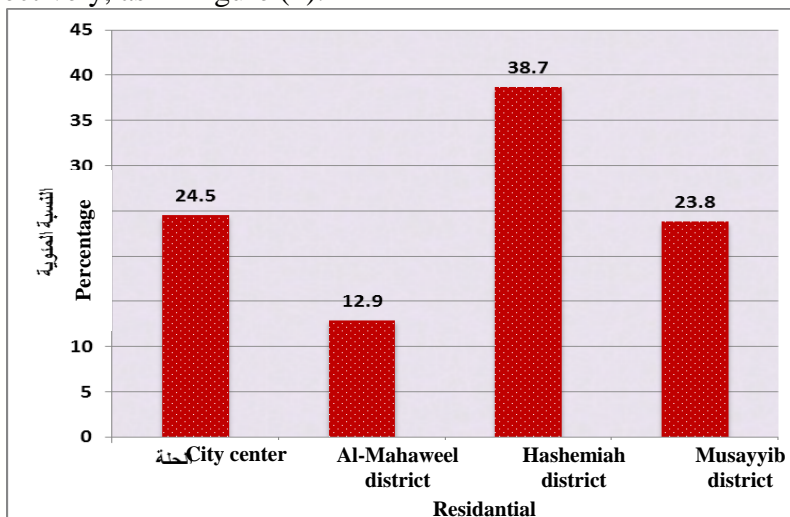
## Methods :

The information related to the infected people was obtained from the Public Health Department / Department of Zoonotic Diseases in the city of Hilla - Al-Bakrli, where recorded data on cutaneous leishmaniasis were collected and confirmed as a result of the clinical examination of the injured from the period January / 2019 to January / 2020, where information related to Many patients were documented through photographs taken to show the type of ulcers and the areas of the body most susceptible to infection, and the results were analyzed using the chi-square ( $X^2$ ) using the statistical program (SPSS) Statical Package for Social Science.

## RESULTS AND DISCUSSION :

The number of recorded cases of people with cutaneous leishmaniasis reached 155 in Babil Governorate and some of its districts, where the results of the current study recorded a significant difference ( $52.53 = X^2$ ,  $P \leq 0.001$ ) between the infection of

cutaneous leishmaniasis and the residential location, as the highest infections were recorded in the Hashemite district, where it reached The number of patients is 70 patients, with an infection rate of 38.7%, followed by the Hilla center, which recorded 38 injuries, or 24.5%, while the lowest infection rate was in Al-Mahaweel district with 30 patients, and Al-Musayyib district with 17 patients, with a rate of 12.9% and 23.8%, respectively, as in Figure (1).

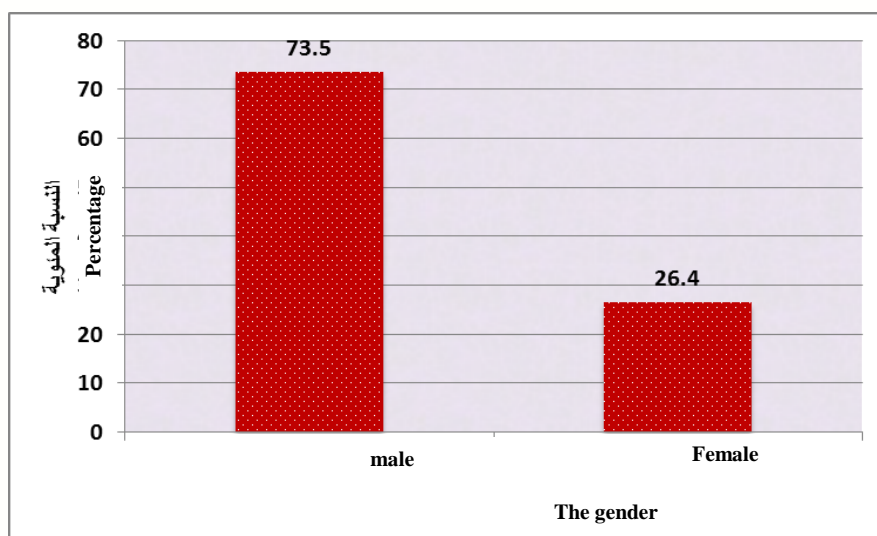


**Figure (1) shows the incidence of cutaneous leishmaniasis in Babil Governorate, according to the residential location**

Cutaneous leishmaniasis is an endemic health problem in Iraq, especially in the central and southern regions of it, where it has been observed that the disease has increased and many foci have appeared in many districts of the governorate, and this depends on the carrier of the parasite, which is represented by the sand fly insect, as it depends on the presence of the storage host as a focus for it and the geographical location Basically, where the results of the current study showed that there was a clear significant difference between the cases of the disease and the residential location, where the highest cases of infection were concentrated in the Hashemite district, reaching 70 (38.7%) cases, compared to the center of the city of Hilla, which amounted to 38 (24.5%) cases, the reason is due to the deterioration of the level of health services in the district, the neglect of combating (sandflies) that carry the parasite and rodents, a large number of stray dogs and cats that are present in the residential areas of the Hashemite district, in addition to the lack of attention to public hygiene. Other reasons for the spread of the infection are the movement of citizens and their movement in the areas of the governorate, which contributed to the increase in the incidence and spread of the disease, and the low level of health due to the instability of the political situation in the country in recent years, and the movement of the population and their permanent movement has increased the rates of infection and its spread in an epidemic manner, The results of the study are consistent with the findings of the researcher Kadhim (2020), in the province of Babil, where the highest infection rate was recorded, 145 (67.4%) patients at the Hashemite General Hospital who were infected with cutaneous leishmaniasis, compared to the total number of infections, which amounted to 215 patients, and these results are close to what I reached, the researcher Hussien (2019), as the recorded infection rate was 50% in all districts of Babil Governorate, the results of the study also agree with what the researcher Reem (2019) concluded in the Najaf governorate, where they explained

that the deterioration of the country's health situation and the movement and migration of the population between the various governorates of Iraq as a result of the changing and unstable political situation that the country is witnessing led to the spread of the disease and its significant expansion, and the convergence of the current results to what It was found by Al-Difaie (2014), in Al-Qadisiyah Governorate, as the results of her study showed that the spread of cutaneous leishmaniasis is closely related to the geographical distribution of the governorate, as the infection can spread between different geographical regions and at different rates to extend to villages that are 15 miles away from the infection center, In addition to what was mentioned by the researcher Belqis (2019) in Salah al-Din Governorate, it showed that the reason for the spread of the disease is the lack of health services and preventive means against the carrier (sand fly) in residential areas, in addition to the lack of attention to personal hygiene, and she explained that population density, displacement, migration to other cities, and reproduction Sandfly in certain places near rivers and swamps and different climatic conditions helped spread the disease ,the results of the study agree with what Azhar (2015) mentioned, and showed in her study that the location of residence, the place of work, and the time of appearance of lesions are important data for determining the location of infection that may occur.

The results of the current study showed that there was a significant difference with a probability level ( $P \leq 0.001$   $X^2 = 75.68$ ) between the percentage of infection with cutaneous leishmaniasis and between the two sexes, as the highest infection was in males 114, with a rate of (73.5%), while the number of female infections was 41, with a rate of (26.4%). As shown in Figure (2):



**Figure (2) shows the incidence of cutaneous leishmaniasis in Babil Governorate, by gender**

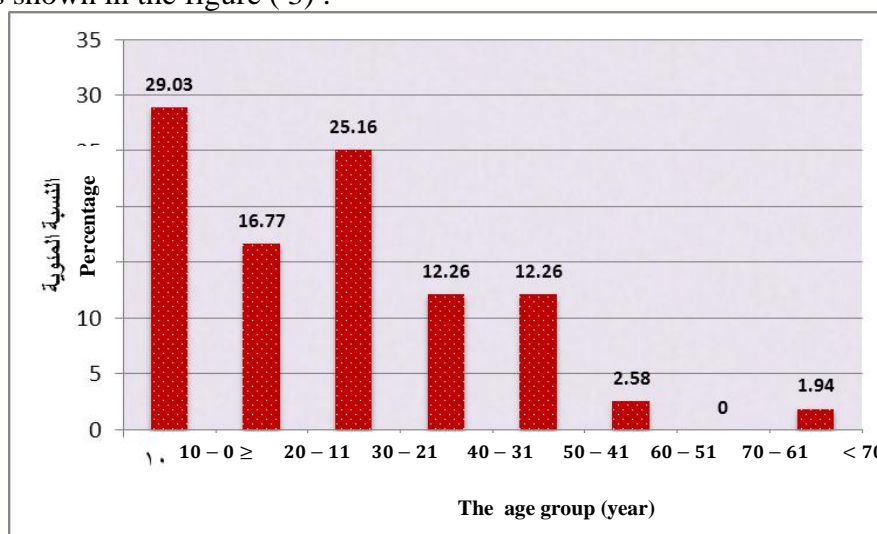
The reason is due to a large number of patients in the governorate's hospitals who are males and those who are involved in the battlefields, and their frequent movement and continuous movement between cities according to the nature of the work makes males more vulnerable to the stings of the sand fly. Also, the bodies of males are exposed, which exposes them to insect stings compared to females, according to customs and traditions and as there is Males are outside the house for long periods,



and since the activity of the insect is more outside than inside the houses, the results of the study agree with its findings Kadhim (2020) In Babylon governorate, where the number of males was 124 infected, with a rate of (57.6%), while the females were 91 infected, with a rate of (42.4%).

The results of the study also agree with Hussien (2019), as the infection rate for males was 46%, while the infection rate for females was 36%. Al-Hucheimi( 2014), where the incidence of males was 62%, while the incidence of females was 38%.

The results of the current study also showed that there were significant differences, with a probability level  $\chi^2 = 115.95$ ,  $P \leq 0.001$ ) The percentage of cutaneous leishmaniasis infection according to the age group, as the highest infection rate was in the age group ( $\leq 0-10$ ) years, reaching 29.3%, followed by the category The age group (21-30) reached 25.16%, while the lowest infection rate was in the age group ( $\geq 71$ ) years, reaching 1.94%, while no infection was recorded in the age group (61-70) years, as shown in the figure ( 3 ) :

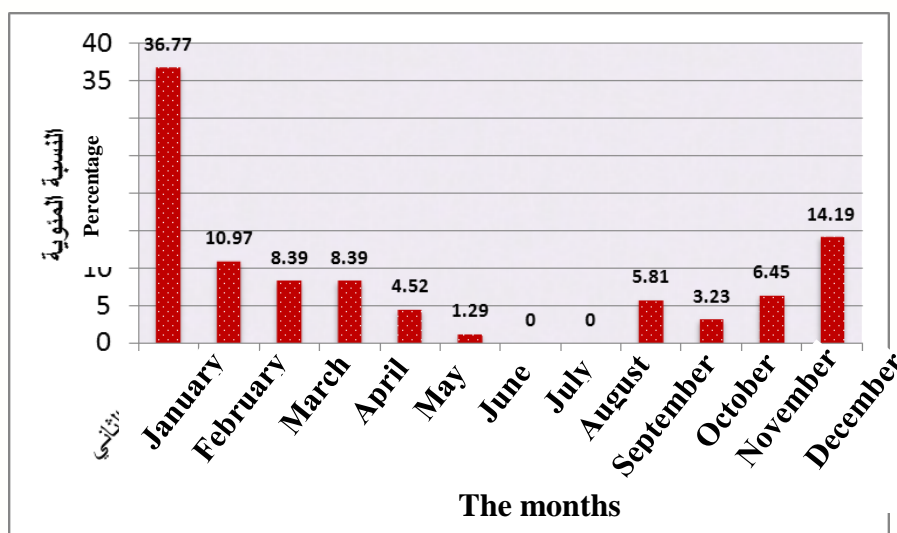


**Figure (3) shows the incidence of cutaneous leishmaniasis in Babil Governorate, according to age group**

Young children, whose ages range from one to seven years, are exposed to cutaneous leishmaniasis, and the infection is less at older ages (Abdula, 2000). Most of the infections were in the ages of less than one to ten years, with the highest infection rate being 29.3%, The reason is due to the weakness of the immune system of children compared to the elderly and their lack of awareness during the sting of the vector insect during their sleep, while the infection was distributed to a lesser extent in the age group older than 71 years, while no infection was recorded in the age group (51-60) years, and this is due to the exposure of the elderly to the insect sting repeatedly, which gives them immunity against the disease. Where the results of the current study agree with what Azhar (2015) indicated in Karbala Governorate, where the highest infection rate was recorded in the age group (6-10) years, at a rate of 66.66%. The results of the study agree with what was recorded in Belqis's study (2019) in Tikrit Governorate, The highest incidence in children within the age group (1-10) years.

The results of the current study also showed that there was a significant difference in a level of probability ( $P \leq 0.001$   $X^2 = 121.01$ ) between the percentage of infection with cutaneous leishmaniasis and its distribution according to the months of the year,

as the emergence and spread of infections during the study period was linked to the decrease in temperature, as the highest infection was recorded in January 57, with a percentage of 36.77% compared to the rest of the months, followed by December and February with 14.19% and 10.97%, respectively. Infection cases decreased in June 2 (1.29%), while no cases were recorded during July and August, as shown in Figure (4) :



**Figure (4) shows the incidence of cutaneous leishmaniasis in Babil Governorate during the months of the year**

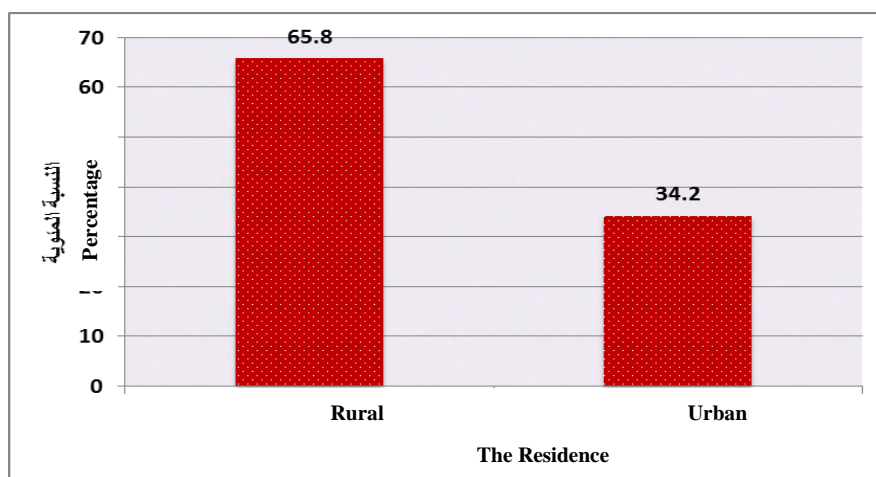
The researcher Tarish (2006) found that the peak of the spread of the disease was in February followed by December, while Hadi (2009) indicated that the monthly distribution of cases begins to appear and increase during December and reaches its peak in January and February, and this is generally consistent with the results of the study current .

The difference in the monthly distribution of cutaneous leishmaniasis infections may be related to the activity of the sand fly that transmits the disease and its relationship to the climatic conditions during the study period in terms of temperature and humidity in the development of the female insect that needs blood during its life cycle and the maturation and development of its eggs is important to complete its life cycle in the hot months From the spring and summer seasons, and this coincides with the activity of the vector insect, its density, and the incubation period that it spends, as this period depends on the type of parasite and the extent of the host's response, As symptoms begin to appear at the beginning of the winter and cold season. The results of the current study are similar to the study of Aseel *et al.* (2017) in Diwaniyah Governorate, which recorded the highest infection rate during January and February, 17.74% and 25.81%, respectively.

The results of the current study showed that there were clearly significant differences with a level of probability  $X^2$  12.4,  $P \leq 0.001$ , between the percentage of infection with cutaneous leishmaniasis and the type of housing, as shown in Figure (5), as the highest infection rate was in people who live in rural areas 93 (60%) While the injuries reached 62, or (40%), in the housing of the urban type, lack of interest in hygiene, lack of health awareness, the large presence of domestic animals and livestock breeding inside the dwelling, storage hosts, especially dogs, and the

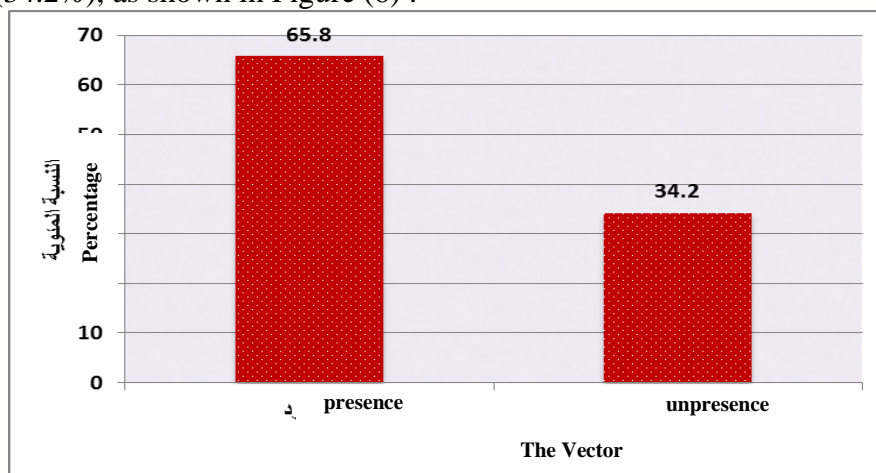
presence of insect vectors play a major role in the spread of the disease in large areas of rural areas.

The results of the current study agreed with the findings of Fadel and Nabil (2016) in Dhi Qar Governorate, as they recorded the highest infection rate in rural areas 73.2%, while injuries reached 65.2% among people who live in urban areas. The results of the study also agree with What was found by AL-Difaie (2014) in Diwaniyah Governorate, where the highest infection rate was recorded in rural areas, 41.81%.



**Figure (5) shows the incidence of cutaneous leishmaniasis in Babil Governorate, according to the type of Residence.**

The results of the current study showed that there were clearly significant differences with a probability level of  $P \leq 0.001$  between the infection of cutaneous leishmaniasis and the presence of the carrier (insect), where the highest infection rate was among patients who had insects in their homes and reached 102 (65.8%), the lowest infection rate among patients whose homes were devoid of the carrier (insect) was 53 (34.2%), as shown in Figure (6) :



**Figure (6) shows the percentage of cutaneous leishmaniasis infection in Babil Governorate and the presence of the vector**

The results of the current study are consistent with the findings of Ali (2015) and Braa (2014), as they recorded a significant increase in the rate of infection in places

where there are insects, other vectors, and the rest of the storage animals such as dogs. Avoiding the vector insect is very important to get rid of the infection and reduce its numbers in Rural homes with pesticide control methods (Markl and Malhoul, 2004).

### Conclusions :

1. Cutaneous leishmaniasis is considered a health problem in Iraq, especially in Babel province and its districts, as it is considered a common disease between humans and animals, which has caused a high incidence of it in recent years.
2. Cutaneous leishmaniasis affects males at a higher rate than females, and the highest infection rate was recorded in the Hashemite district, and the number of infections increased in January among the age groups less than ten years old, as these groups were more susceptible to infection, and the disease is more present in rural areas than in urban areas As the infection rates increase in the places of the presence of the insect vector.

### Recommendations :

1. Health awareness of citizens about the dangers of the disease and methods of transmission and prevention.
2. Controlling the sand fly insect that carries the parasite during its seasons of spread and getting rid of organic materials, waste, and debris that are breeding grounds for this insect.
3. Control of the host that stores the parasite that causes cutaneous leishmaniasis, such as dogs and rodents, in cooperation with the Department of Health, the environment, the responsible authorities, and the citizens, and confirming the breeding of pets in special breeding places, and adherence to health conditions.

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