

Study Outbreak of Cutaneous Leishmaniasis in Municipality of Al-Zintan 2019AD

دراسة تفشي داء الليشمانيا الجلدية في بلدية الزنتان لسنة 2019

Ibrahim Mohamed El-tellawi

د. إبراهيم محمد التلاوي

المخلص:

أجريت هذه الدراسة لمعرفة مدي انتشار داء الليشمانيا في الجبل الغربي (جبل نفوسة) تحديدا بلدية الزنتان والتي تنظم مدينة الزنتان، المرهان، طبقة، القرية الشرقية القرية الغربية وحدودها غربا الرجبان، وشرقا الريابينة، ومن الجنوب الغربي قصر الحاج والجنوب سهل جفارة وشمالا وادي سوف الجين، والتي تقع وسط الجبل الغربي، وتبعد حوالي 136 كم شمال غرب مدينة طرابلس. وتهدف هذه الورقة تحديد فترات الظهور لمرض داء الليشمانيا خلال الفترة من 1-1-2019م الي الفترة 31-12-2019 م، سجلت عدد الحالات 96 حالة بداء الليشمانيا الجلدي في جميع المناطق بالبلدية، وكان معدل الإصابة في الفئات العمرية من 20 إلى 40 عاما و اقل في الجنس مقارنة بالفئات العمرية الاخرى التي تزيد عن 40 عاما والتي تصل إلي أكثر من 60% للذكور و 45% عند الإناث، فيما ارتفع معدل الإصابة بداء الليشمانيا في منطقة القرية الشرقية بنسبة 36.45% مع نهاية الخريف وبداية الشتاء، اختلفت عدد القرحات في الأطراف السفلية 27 حالة، وفي الأطراف العلوية 30 حالة، وفي الأطراف معا 20 حالة ونلاحظ أن جميع مناطق الجسم بها تقرحات هي مناطق مكشوفة وبالتالي فهي عرضة لدغة ذبابة الرمل.

Abstract

This study was conducted to determine the prevalence of Leishmaniasis in th north-western especially Nafusa Mountain (municipality of Al-zintan) which including (Al-zintan, Al-Marhan, Tabagah, Al-Qurayyat Al-Asharqiya and Al-Qurayyat Al-Gharbiya), the borders the municipality west by Al-Rujban and east -Rayyana, from northwest Qasr Al-Haj and north Jafara plain and south by Wadisuf-Al-jin, which is located on the middle western mountain peaks, 136km southwest of Tripoli, where it is located approximately in the center of the western mountain, the coordinates 31° 55' 43" N and 12° 15' 09" E, identification of periods of appearance, for the patients of Leishmania during the period from 1st January 2019 to the period 31st December 2019 the number of patients registered 96 Cases of dermal Leishmaniasis in all areas of the municipality, the rate of infection in the age groups from 20- 40 years and lower in the genders compared to other age groups more than 40 years of age, reaching more than 60% In males, 45% in females, there was an increase in The incidence of Leishmaniasis in some areas of the municipality, where the highest percentage of Leishmaniasis was found in Al- Qurayyat al- Asharqiya area 36.45% With the end of the autumn and the beginning of the winter with the beginning of the low temperature, the number of ulcers also varied condition that has ulcers in the lower limbs only 27 cases and in upper limbs 30 case with ulcers in the upper limbs and lower extremities together 20 cases, we note that all regions of the body with ulcers are open areas and therefore susceptible to sand fly bite.

Keywords: Leishmaniasis, vectors, Visceral Leishmaniasis, Muco-cutaneous leishmaniasis, cutaneous leishmaniasis.

Introduction:

leishmaniasis is one of the most wide spread diseases in the world, the scientist (Zuckerman and Liaison, 1977) indicated that this disease is one considered One of the endemic diseases in the countries of the middle east, Africa, Asia and south America, with about one million to one a half million cases of cutaneous leishmaniasis and about half million cases being record annually. visceral leishmaniasis (WHO, 2000). Infection with cutaneous leishmaniasis leads to the appearance of one or more skin ulcers on the face, arms and all exposed organs of the body and its cause is due to the parasites leishmania tropica. the ulcer heals by itself within a period ranging from three

months to two years, the infection is not accompanied by fever or any side effects, leaving a trace or ascar that deforms the body from an aesthetic point of view (Bowman and Rand, 1980).

Leishmaniasis is transmitted by the bite of the female sand fly genus *Phlebotomus papatasi*, which increases activity at sunset and early morning. It carries the leishmania parasite, and that is when the insect takes its meal from the blood of infected hosts or storage hosts, which are humans and animals such as rodents (Alexander, 1995). Leishmaniasis appears in one of three forms:

1- Visceral Leishmaniasis (Kala-azar).

2- Mucocutaneous Leishmaniasis (American leishmaniasis or Espundia or Uta).

3- Cutaneous Leishmaniasis (Oriental sore or Baghdad Boil or Delhi Boil).

Consider visceral leishmaniasis from chronic diseases which are caused by the leishmania parasite called *L. donovani*, this epidemic spreads in India, Africa, Mediterranean countries and Latin America, characterized by the appearance of irregular fever, enlargement of the liver and spleen, anemia, wasting, general weakness and the appearance of granulomatous lesions in the affected organs and leads to death in the case of no treatment called (black disease) (WHO, 1996).

Mucocutaneous Leishmaniasis is a disease caused by *L. braziliensis*, which spreads in most countries of central and south America, such as Brazil, Argentina, Uruguay, Peru, Costa Rica and Mexico.

Cutaneous leishmaniasis is the most common disease caused by *L. tropica*, which reaches 50-75% of all cases (WHO, 2000). CL is endemic in the north-western region of Libya, especially in Nafusa Mountains. The earliest report of two cases was in 1930 (A. A. El-Buni, I. Jabeal, and A.T. Ben-Darif, 2000).

Later 40 cases were recorded in a small village called Yafran in Nafusa Mountains between February 1991 and December 1992, 445 CL cases were diagnosed by skin biopsy and microscopy. The peak season of infection was in November 1991 and December 1992. The causative agent was *L. major*, and it was more common in males than females with a 1.9:1.0 ratio of male to female. The highest incidents were among the people between 11 and 20 years old (M. Z. Abdellatif, K. El-Mabrouk, A.A. Ewis, 2013).

The pathogen of this disease is a parasite of flagellated protozoan after intercourse with the same genus leishmania belongs to the family trypanosomatida and causes leishmaniasis in humans (Reguera et al., 1998) and reference (Zuckerman and Lainson, 1977) the (Gunningham, 1885) that he was the first to discover the parasite in sections of skin coils for patients with Delhi boil in India.

Leishmania life cycle:

The life cycle of the leishmania parasite, as shown in figure (3), includes frequent shifts in shape between the hosts, which are the immotile Amastigote form in the phagocytes inspiring the storage hosts (rodents) to the Promastigote form. Which is movable outside the cells lining the intestine of the sand fly (Zuckerman and Lainson, 1977). Take female sand fly Amastigote during feeding on human blood or animals (Rodents), where this stage passes to the stomach and then enclosed in it by secretory membranes the lining of the cells of the middle

(Gemetch, 1974) and these membranes retain the Amastigote stage within the middle intestine. During the first three days, then convert to promastigote within the middle intestine of the vector transforms to the spindle-shaped stage called the reproductive stage (1994, Sacks et al.) and the parasite multiplies to a preparation large by binary fission and adheres to the epithelial cells of the middle intestine by flagella (1998, Dillon and

Lane),the parasite migrates towards the anterior intestine and the apical parts of the insect within 4 to 5 days, where it turns to the infective phase, which is fast moving and injects the infectious phase with the saliva of the infected feeding insect when stinging the exposed body parts of the new host during feeding (Mengeling et al., 1997),the infectious stage travels into the host's blood and is ingested or engulfed by macrophages or other types of mononuclear phagocytic cells in the skin where it resists digestion and converted to Amastigote stage which divide by binary fission or sexual reproduction intra cellular into large numbers resulting explosion and release of large numbers(Kreutze el al ., 1993).



Figure 1. Phlebotomus papatasi vector of L. major



Figure 2. Meriones libycus vector L. major

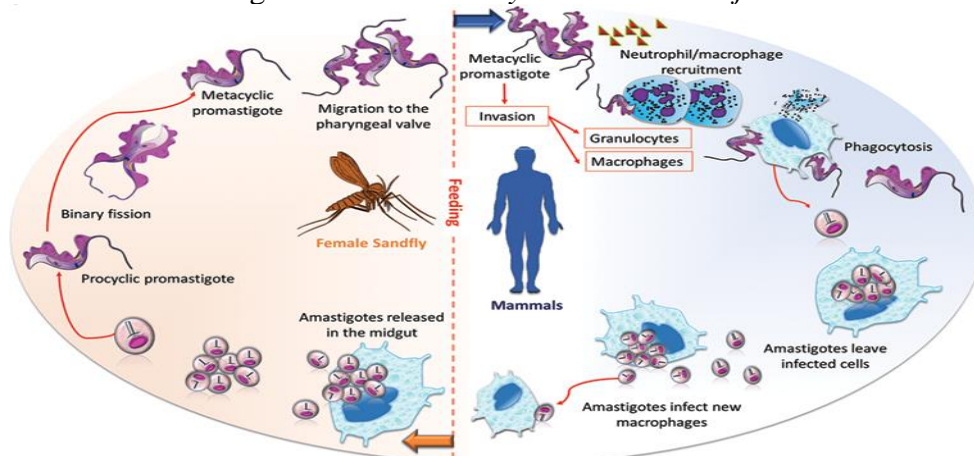


Figure 3: life cycle of Leishmania (Klaus et al ., 1999)

Pathogenicity of leishmaniasis:

The lesion appear in the form of small red circles at the site of the bite and enter the stage the flagella of the parasite spreads to the skin during feeding of a female sandfly(Bron,1991) the small circles turn into edema within 48 hours and then turn into a small papilla that slowly increases in size to become in the form of a knot, hard to the touch. The small nodes eventually ulcerate forming an necrotic ulcer and distorted on the skin (Babajer et al. 1991) dry lesions are covered with a thin central crust beneath which small ulcers are hidden, while wet lesions are covered with infiltrated fluids and have a hard edge often associated with bacterial or fungal infections,the injured is similar to self-healing if no complications occur within a year or less than the injury,leaving a

permanent scar that is slightly lower than the surface of the body and has irregular and distorted edges (Morell, 1995).

Objectives of the study:

The study aims to know the number of injured people during the year 2019 AD and more areas of the municipality of five terms of infection, in addition to knowing the most the vulnerable age, as well as knowing any periods of the year in which the infection is frequent.

Materials and Methods:

Department of dermatology at al-zintan and Al- Qurayyat teaching hospital was chosen to obtain the recorded.

Statement above cutaneous leishmaniasis.the study relied on the cases recorded in the records and recorded in them as a result of the clinical examination of the injured for the period from 1st January 2019 to 31st December 2019.

The information on the injured was recorded. the number of cases recorded during this year in the areas of Al-zintan municipality was 96 cases of cutaneous leishmaniasis, including the municipality of Al-zintan .



Figure 4. Libyan map showing the location of municipality of Al-Zintan

Results and Discussion :

Table (1) shows the various age groups who showed symptoms of infection, amounting to 21 individuals. the rates of infection of age groups from one month to 30 years a reaching to 14 individuals and a percentage of 66.5%, where the infection increased in these age groups and this is consistent with a study conducted by (Suker, 1988), this is due to the fact that the insect prefers the ages it has more attractive factors in terms of skin vitality, as well as frequent contact with the external environment. As for the age groups from 31 years to 60 years, the number of infected people of both genders was 6 individual , and percentage 28.48%, As for the age groups from 61 year and over, the number was 1 case , i.e 4.7%.

The relationship between gender and infection:

According to the results of the study , Cutaneous leishmaniasis infection occurred for both genders, as after the infected males 50 individual, i.e 52.08%, while in females, there were 46 cases of leishmaniasis, i.e 47.91% of the total number of infections, as shown in table (1). the difference in the rates of infection is due to customs and tradition social, as females wear clothes that give all areas of the body, especially in the country side, unlike males who often show some parts of the body, as well as the nature of the males presence outside more than the females (Abul-hub and Mahdi., 1970), and figure (5) shows the rate of infection in both genders.

N	Age	Males	Females	Total	Ratio
1	1M-10y	7	8	15	15.62%
2	11y-20y	9	7	16	16.66%
3	21y-30y	12	8	20	20.83%
4	31y-40y	10	6	16	22.91%
5	41y-50y	9	5	14	19.79%
6	51y-60y	2	3	5	5.20%
7	61y-70y	1	1	2	2.08%
8	71y-80y	0	0	0	0.0%
9	81y-90y	0	01	01	1.04%
	Total	50	46	96	100%

Table (1) shows the incidence of leishmaniasis by age and gender

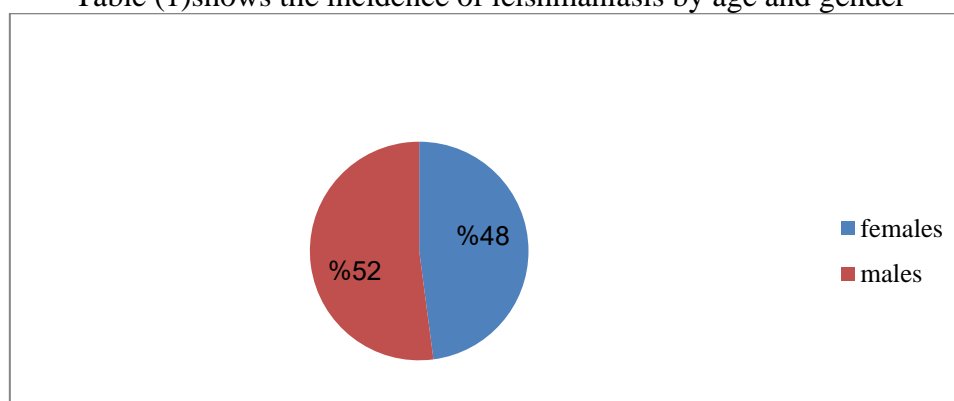


Figure 5. shows the rate of infection in both sexes

The prevalence of infection during the months of the year:

The study showed that the number of infected people was more during the period in which the degree of infection decreased temperature, the incidence of infection was very small during the period from January to July, but during the month of August, the incidence of disease began to increase clearly until it reach its peak was during the months of and October, November and December, where the number of cases recorded during these months reached a total of 79 cases, i.e 82.29% compared to the rest of the months of the year in which the infection decrease and was absent in the rest of the months table(2) and this it agrees with What was stated by it (Sadick and Zeibgelizabeth., 1997).

Month	Number of cases	Percentage
January	02	2.08%
February	0	0.00%
March	0	0.00%
April	01	1.04%
May	0	0.00%
June	0	0.00%
July	01	1.04%
August	04	4.16%
September	09	9.37%
October	17	17.70%
November	30	31.25%
December	32	33.33%
Total	96	100%

Table (2) Number of injury people by months of the year

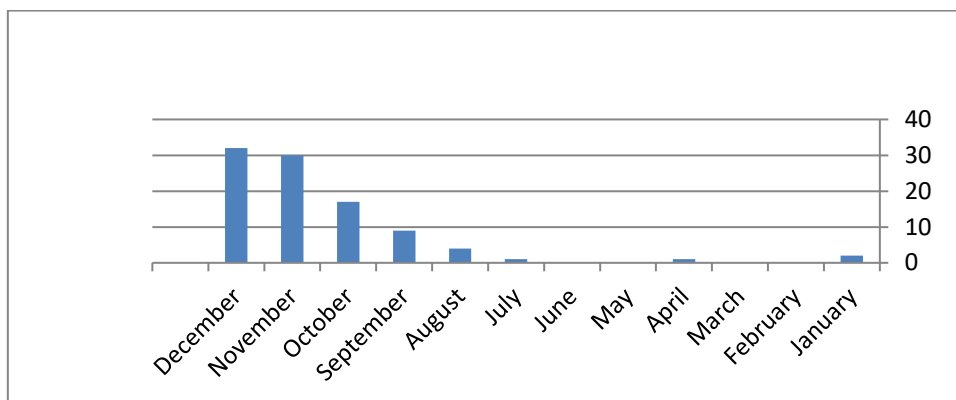


Figure 6.shows the number of injured people during the month and year
Prevalence of cutaneous leishmaniasis by municipality areas:

The study showed that areas have a high infection rate compared to other areas, where the highest of these infection areas was Al- Qurayyat al- Asharqiya, with the number of registered cases reaching 35 cases out of the total number of cases ,i.e percentage 36.45% then Al-Qurayyat Al- Gharbiya in the second place in the number of cases ,registered and in20 individual i.e ratio20.83% ,the least affected area of the municipality are in Al Marhan ,where 7 cases was recorded, i.e 7.29% percents in table (3).

S.N	Region	Number of cases	percentage
1	Al- Marhan	07	7.29%
2	Al zintan	24	25.00%
3	Tabagah	10	10.41%
4	Al- Qurayyat al- Asharqiya	35	36.45%
5	Al-Qurayyat Al- Gharbiya	20	20.83%
Total		96	100%

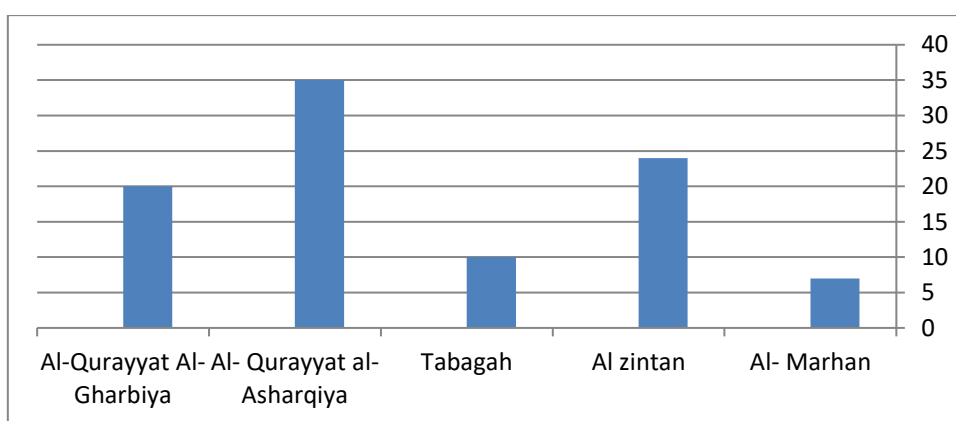


Figure 7 . shows the number of people with leishmaniasis

Number of skin lesions and their distribution on body areas:

The results showed that the parts most susceptible to infection were in the exposed parts of the body, that is exposed to sand flies, especially the extremities. Where the number of people with ulcer in the upper extremities was about 34 individual, also number of people with ulcer in lower extremities was about 27 individuals , then joint injuries, meaning ulcers in the upper and lower extremities together ,with a

number of 61 case, and this consistent with what was stated by (Rassam,1985),and it was more areas of decreased incidence are the face table(4).

S.N	Site infection	Cases
1	Upper extremities	34
2	Lower extremities	27
3	Upper and lower extremities	20
4	Face	08
5	Upper,lower extremities and face	07

Table(4):shows the number of cases and sites infection

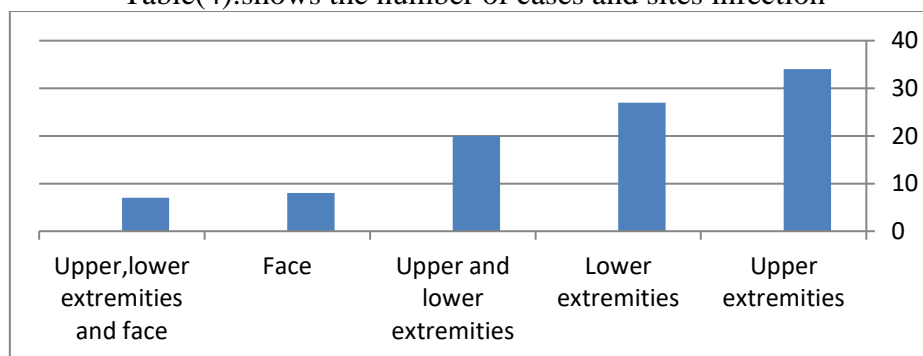


Figure 8. Shows the number of cases and sites infection

Conclusion:

This study conducted to determine the prevalence of leishmaniasis in municipality of Al-zintan and rate of infections in the ages from 20 to 40 year and lower in the genders, reaching more than 60% in males and 45% in females.

Recommendations

- 1- Finding appropriate ways to eradicate the sand fly.
- 2- Conducting a medical survey during months of the years in rural areas to determine numbers injuries people.
- 3- Publishing brochures to introduce the disease and early treatment methods to avoid deformities of the body.
- 4- Promote research and use of effective methods of controlling leishmaniasis

References

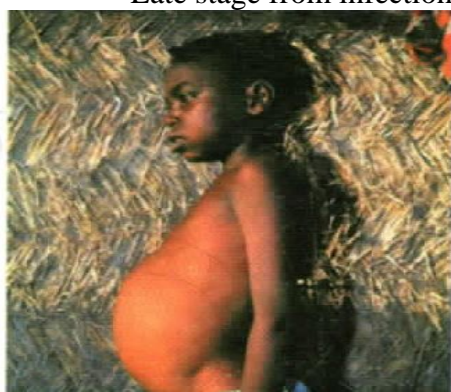
- 1-Aboul-hab, J .and Mahdi , T .(1970) : Seasonal of Phlebotomus (Diptera : psychodidae) and flies of Baghdad , area . Iraq . Bull . End. Dis . , 10 :81 – 49
- 2-Alexander , B . M. C .usma , H . Candena , B I .Quesada . Y .Solarte , Rona , B I .Travi . (1995) . Evaluation impregnated bendents and Cutains Against Phlebotomine sand flies in vall del .Colombia . Entomol ; pp . 279-283
- 3-Babajer ,K . transmission . Iragi . J .Microbiol. 5(2) : 108-119 .B ; Babajev , O : G .and Koreepano V .V .I .(1991) .Treatment of Cuttaneous Leishmaniasis Using a Carbon dioxide Laser .Bull .J . ; 69 (1) : 103 -105
- 4-Baron S .M. (1991) .Cutaneous and Mucocutaneous Leishmanissis Medical . Microbiology . 3th . Churchill Livingstone New York . pp.1027 – 1030.
- 5- Bowman , W . C . and . Rand ,M .J .(1980) .Leishmaniasis Text .Book of pharmacology 2ndEdt . pp.21-36 ; Blackwell Scientific Publication. London
- 6- Dillon , R .J .and hane .R .P .(1998) . Detection Leishmania. Lipophosphogly Binding protein in the gut .of the sand fly vector Parasitology . 118 , 27 – 32 .

- 7-**Gemetchu , T. (1974)** .the morphology and fine structure of the mid Gut and peritrophic membrane of the a dult female phlebotomus Longides parrot and martin (Diptera : psycho didae) .Ann .Trop .Med .Parasitol ., 68 : 111- 24
- 8- **Kreutzer ,R .D.; Grogl ,M .; Nera , F. A ;Fryauf .F.D .J .; Magill ,A .J. And Aleman munoz , M. M . (1993)** . Identification and genetic Comparison Leishmanial Parasites Causing Viscerotropic and Cutaneous in Soldirs returing from operation desert strom Am .J .Trop .Med .Hyg ., 49: 357 -63
- 9-**Klaus S N ,Frankenburg S, and Ingber A, Epidemiology of Cutaneous leishmaniasis , clin Dermatol .(1999) 3 . 257-260**
- 10- **Mengeling , J . B . ; Beverley , S . and turco , S . J .(1997)** . Desiging Glycoconjugate biosynthesis foran instent .phosphogly can assembly In Leishmania parasites .Glycobiology ,7 (7) : 873 -880
- 11-**Morwill ,C.M.(1995)** .Eraluation of trans formation.multiplication. I Genes and antigens of parasites a laboratory . manual .2ndad .pig. UNDP /World Babk .
- 12-**Rassam , M. B .; Jawdut .S. Z. .JAI – Husayni , N.K .; Rifaat . L .K Sukkar,F .J .(1985)** . Biochemical Study on Leishmaniasis on Irag .J .Bio .Sci . RES . ; 103 .16 - 83
- 13-**Reguera , R . M ., J.C. Cubria and D.Ordozen (1998)** .Review the pharmacology of Leishmanis . J .Pharmacy .30 (4) : 435 -433
- 14- **Sacks ,D .L .; Saraiva ,E .M .; Rowton ,E . ; Turco ,S .J .and Pimenta P . F . (1994)** .The role of lipophsphglyan of Leishmaniain Vactor Competence .parasitol ., 108:55 -62
- 15-**Sadick , N.S . (1997)** .Cutaneous manifesation of protozal infections Dermatological Clinics . Infect . Dermatol . , 15 (2) : 291 – 293
- 16-**Sukker.F.(1988)** . The possible Vector of Visceral Leishmanis in Irag Bull . End Dis .Baghdad . , pp . 27 .36
- 17-**WHO .(1996)** . Report of WHO regional office for the eastern Mediterranean 2pp .132-7.J.vol
- 18-**WHO.(2000)** N.Leishmania / HIVco.in fection.WHO / LEISH /2000 .42. CTD TRX . INHO : 12 PP . Genera
- 19-**Zeibig Eliabeth.A .(1997)** . Clinical parasitology a .Approac printed in The U .S.A.P.320
- 20-**Zuskrrman A.and.Lainson.R.(1977)** . parasitic protozo Leishmania Academic press – New York pp : 57 -133
- 21-**S. Odiwuor, et al., Natural Leishmania donovani/Leishmaniaaethiopica hybrids identified From Ethiopia. Infect Genet Evol. 11: 2113-2118.**
- 22- **M. Z. Abdellatif, K. El-Mabrouk, A. A. Ewis.2013. An epidemiological study of cutaneous leishmaniasis in Al-jabal Al-gharbi, Libya.Korean J. Parasitol. 51:75-84.**
- 23- **A. A. El-Buni, I. Jabeal, and A.T. Ben-Darif, 2000. Cutaneous leishmaniasis in the Libyan Arab Jamahiriya: a study of the Yafran area. East Mediterr Health J., 6: 884-887**

Supplements



Late stage from infection by visceral leishmaniasis



Visceral Leishmaniasis(Kala-azar)



Cutaneous leishmaniasis



Muco-cutaneous disease (Mouth, Nose and Ear injury)



Phlebotomus sergenti, a vector of L. major



Mode injection of drugs

