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An outbreak of cutaneous leishmaniasis among internally displaced persons from the Nineveh governorate reported by Duhok Preventive Health Department from 2015 to 2017

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Berivan O. Rashid[1] Zeyad S. Al-Dabbagh[2] Sirwan M. Aswad[3] Samim A. Al-Dabbagh[1]* Hadia N Al-Hayali[4]

Abstract

Background and objective: Cutaneous leishmaniasis is an endemic disease in Iraq, mainly in central and southern regions. The disease is, however, lower or rare in Kurdistan region of Iraq; which is situated to the north of the country. After the summer of 2014, there was a massive displacement of population to Kurdistan, mainly from the central region. The aim of this work was to investigate the outbreak reported by Duhok preventive health department among internally displaced persons from Ninewa to Duhok governorate between 2015-2017.

Methods: A cross sectional study design was conducted on the records of internally displaced persons from Nineveh governorate who were diagnosed clinically as cutaneous leishmaniasis by Duhok health authority. Information regarding age, gender, occupation, places of current residency, expected vector exposure, displacement date and status, number of lesions, and date of onset.

Results: A total of 451cases were reported during the study period. The mean age was 22.7±17.1 years, and about 69% of cases were in the age group of 5-44 years. The mean number and SD of lesions was 3.6 (±4.2), with a range of 1-35lesions. Three quarter of patients were off camps during diagnosis. Cases were mainly encountered in autumn. All, except 17, have suspected vector exposure outside Duhok governorate. No significant variation was noted regarding gender, age, occupation, urban/rural residency, and displacement status.

Conclusion: A significant outbreak has occurred in Duhok, an area not known to be endemic with the disease. Close surveillance and strict preventive measures are highly recommended.

Keywords: Outbreak; Cutaneous leishmaniasis; Displaced; Kurdistan Region; Iraq.

Introduction

Cutaneous leishmaniasis (CL) is primarily a zoonotic disease which is transmitted by sand fly to human. Globally about 0.7-1 million cases reported annually, with about 90% of them occurred in 8 countries; three of them are neighboring Iraq.[1-3] The disease is endemic in Iraq, which fluctuated and peaked in the last three decades due to wars, poverty, and population displacement. The rates peaked in 1992 with a prevalence of 45.5 cases/100000 to decline by 2004 then to peak again in 2005, 2006 and 2008. Before ISIS poor suburb of Mosul has frequently considered as a main foci of the disease providing ideal conditions for the sand fly to breed and lay eggs[3-4] The disease was rare in Duhok, and in 2013-2014 Duhok was the only province in Iraq, where no cases of CL were detected among the native population.[5] The situation has, however, changed in 2013, where 39735 Syrian refugees came to Duhok.[6] A total of 21 CL cases were reported among Syrian refugees and was for the first time such

[1] Department of Family and Community Medicine, College of Medicine, University of Duhok, Duhok, Iraq.
[2] Department of Medicine, College of Medicine, University of Duhok, Duhok, Iraq.
[3] Preventive Health Department, Duhok General Directorate of Health, Duhok, Iraq.
[4] Duhok General Directorate of Health, Duhok, Iraq.
* Correspondence: samimaldabbagh@yahoo.com

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number reported in Duhok. Prompt case management, case investigation, and appropriate measures were made to contain the situation. Then, no further cases were identified, and the source of the exposure was identified to be inside Syria. The outbreak ended at mid-year of 2013.[7] In the summer of 2014, the so called Islamic State in Iraq and Syria (ISIS) controlled most of the neighboring Ninawa governorate, pushing 514499 internally displaced persons (IDPs) to Duhok governorate.[6] In November 2016, another, but smaller, wave of IDPs came to Duhok after the start of Mosul liberation operation. Those represented the most significant displacement in comparison to other Iraqi governorates, where by the end of 2016, the refugees and IDPs represented 4% and 30% respectively of the total Duhok population.[8] The risk of the disease was inevitable as IDPs have come from areas known to be endemic in CL. The aim of this work was to investigate the outbreak of CL reported in Duhok by Duhok Preventive Health Department (DPHD) among IDPs from Nineveh governorate

Methods

This is a cross sectional study on the data registered at DPHD. The study was conducted in Duhok governorate, which is part of Kurdistan region of Iraq. It is bordered by Syria, Turkey, and by Ninewa and Erbil governorates. Cases were recruited for two years period from 1st January 2015 to 31st December 2017. All cases diagnosed in Duhok and registered in DPHD among IDPs from Nineveh governorate during the study period were included in the study. Other cases diagnosed mainly by doctors affiliated with Non-Governmental Organizations (NGOs) or by Nineveh health authorities were not included. The DPHD was informed about the latter group in order to supply treatment, which was entirely distributed by DPHD. However, almost all those cases have no or significant missing information and were not diagnosed by dermatologist affiliated with Duhok General Directorate of Health (DGDH). The diagnosis of CL was made clinically by dermatologists. No blood test or smear microscopy was conducted due to the lack of expertise and facilities. Suspected cases diagnosed in camps or by mobile health teams were referred to the nearest hospital to be seen by the dermatologist. Some cases, however, had a direct consultation with a nearby hospital, practically IDPs who were living in rented houses in Duhok. The national surveillance system form was used and filled for each case of CL. The form contains information regarding age, gender, occupation, place of current residency place of expected vector exposure, displacement date and status, visits to other areas conducted during displacement, number of lesions, and date of onset. Nevertheless, there were some missing data in some forms, and calculation was conducted as percentages of total available answers. Descriptive statistics were presented as number, percentage, mean, standard deviation (SD), and ranges. The data was entered as Exile sheets and analyzed by Epi Info. The study was approved by the scientific committee of Duhok College of Medicine and by the ethical committee of DGOH.

Results

A total of 2749 cases of CL among IDPs from Ninewa governorate were reported to DPHD during the study period of which 451 cases fulfilled the inclusion criteria by this study of being IDPs from Ninewa governorate diagnosed by DGDH and registered in the DPHD.[9] All cases were diagnosed clinically as CL. The mean number ±SD of lesions per cases was 3.6 (±4.2), with a range of 1-35 lesions. Table 1 shows the socio-demographic characteristics of the study population. A total of 312 (69.2%) of the cases were in the age groups 5-44 years. It also reveals that three quarter of the cases 342 (75.8) were off-camp during diagnosis, and only 123 (27.3%) of them had returned to their

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original residence while the rest remained in Duhok. Figure 1 shows that the outbreak started in 2015 to peak up in 2016 and then to decrease significantly in 2017.

Table 1: Socio- demographic characteristics of CL patients.

Characteristic		No.	%
Gender	Males	210	46.6
	Females	241	53.4
	Total	451	100.0
Age (years)	1-4	71	15.7
	5-14	97	21.5
	15-44	215	47.7
	≥45	59	13.1
	Unknown	9	2.0
	Total	451	100.0
Camp resident			
	Off-camp	342	75.8
	In – camp	109	24.2
	Total	451	100.0
Displacement status			
	Returnee	123	27.3
	Displaced	328	72.7
	Total	451	100.0
Occupation			
	Students	69	36.5
	Children	66	34.9
	House wife	43	22.8
	Workers	11	5.8
	Total	189	100.0

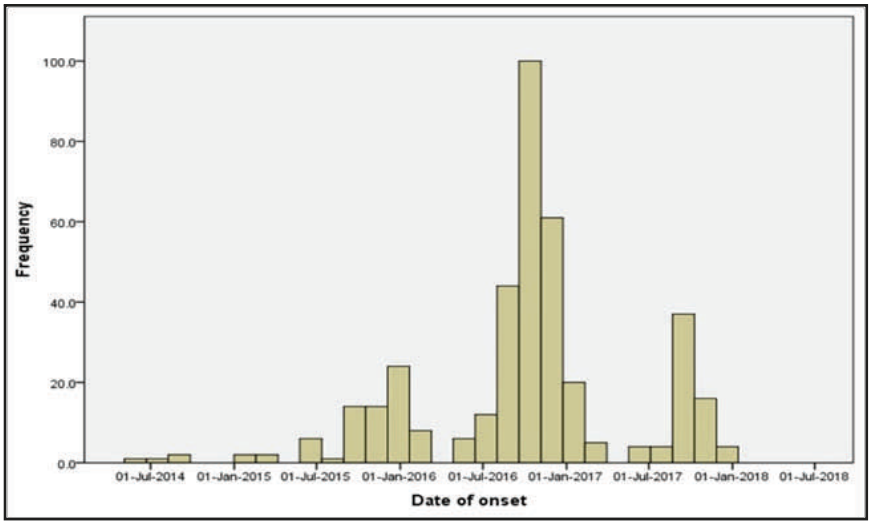

Figure 1: Cases of CL by date of onset.
Based on 388 cases, the date of onset was missing from 63 cases

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Figure 2 illustrates the cumulating data of CL cases for 2015-2017 by the month of onset. The majority of cases occurred in autumn months, with October having the most significant peak. Figure 3 reveals the date of displacement. The majority have been displaced in the summer of 2014, with another but much smaller peak in November 2016. The data from Figure 1 and 3 illustrates that the main outbreak has started one year after displacement to reach the maximum peak two years after displacement.

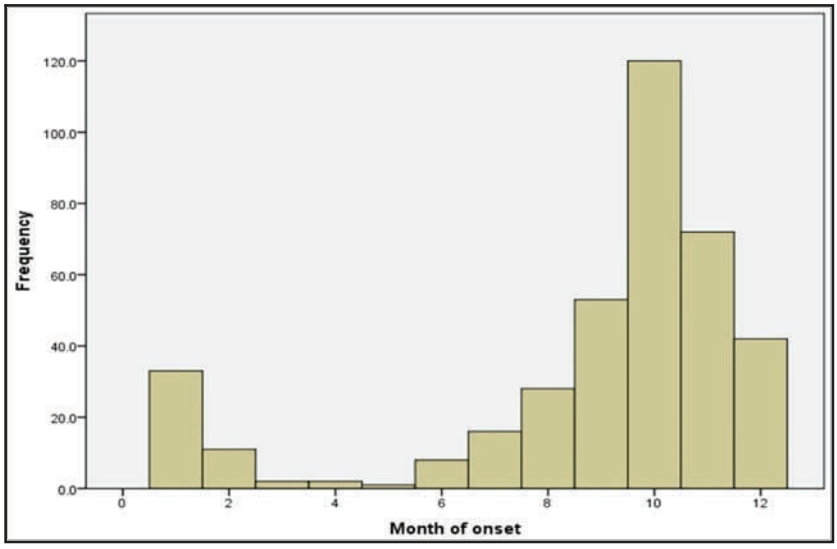

Figure 2: Cases of CL by month of onset for the period 2015-2017.

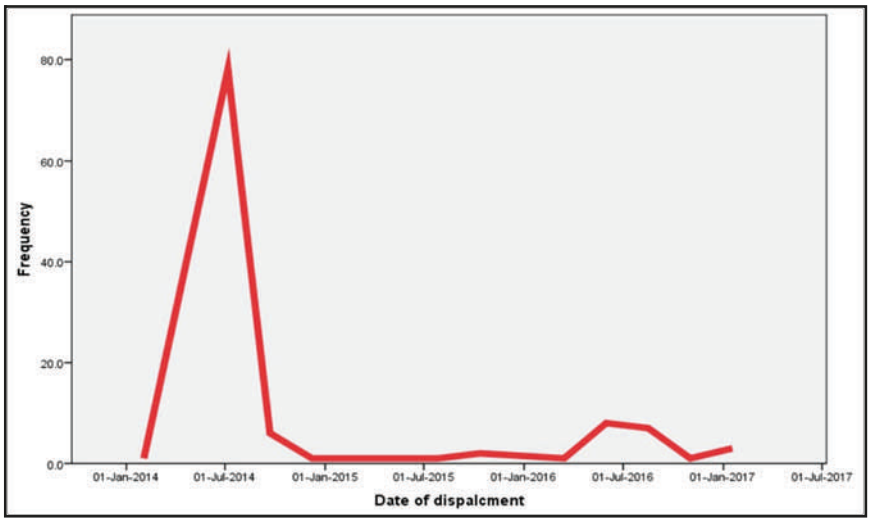

Figure 3: Cases of CL by date of displacement.

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Figure 4 shows the distribution of CL cases by place of residence during diagnosis and by the expected vector exposure. The majority were residents in Sumel, Zakho, and Shekhan district of Duhok during diagnosis while the highest expected vector exposure had occurred in Sinjar followed by Telafar. None of Duhok district showed a site for expected vector exposure except for a spot in Sumel district adjusted to Telafar district of Ninawa governorate.

Discussion

Cutaneous leishmaniasis has been endemic in Iraq for decades. The name of "Baghdad boil" was community given as synonymous of CL.[1,4] The disease has, however, been epidemiologically unstable, particularly in the last 30 years, where epidemics have been reported due to wars and population displacement.[3,4] A significant outbreaks occurred in 1991 and lasted for six years. Another gradual increase started in 2003 and remained until 2013; during those periods, the disease has been widespread in all governorates of Iraq, except for Kurdistan region. The poor suburb of Mosul has frequently considered as a main foci of the disease providing ideal conditions for the sand fly to breed and lay eggs.[4,9] Despite that, however, the WHO used not to record Iraq as a high burden country despite being sharing long boarders with Syria, Iran, and Turkey where a high prevalence of CL was reported.[10] In the summer of 2014, ISIS occupied large areas of Iraq, leading to one of the most significant population displacement in history. The adjacent Duhok governorate was one of the most significant destinations for IDPs from Nineveh governorate, which was almost totally occupied by ISIS. In Duhok, the disease has not been reported in 2013-14 among natives and appeared among Syrian refugees. The source of expected vector exposure was in Syria; an endemic country which faced significant epidemic recently due to civil war.[11] Later on, 5, 57, and 3 cases were reported among Duhok native population in 2015, 2016, and 2017 respectively; and all were found to get exposure outside Duhok while visiting or diploid to endemic areas. The absence of cases among natives in Duhok is mainly attributed to the vigorous campaign of using insecticide. This is done routinely as campaigns twice annually, particularly in

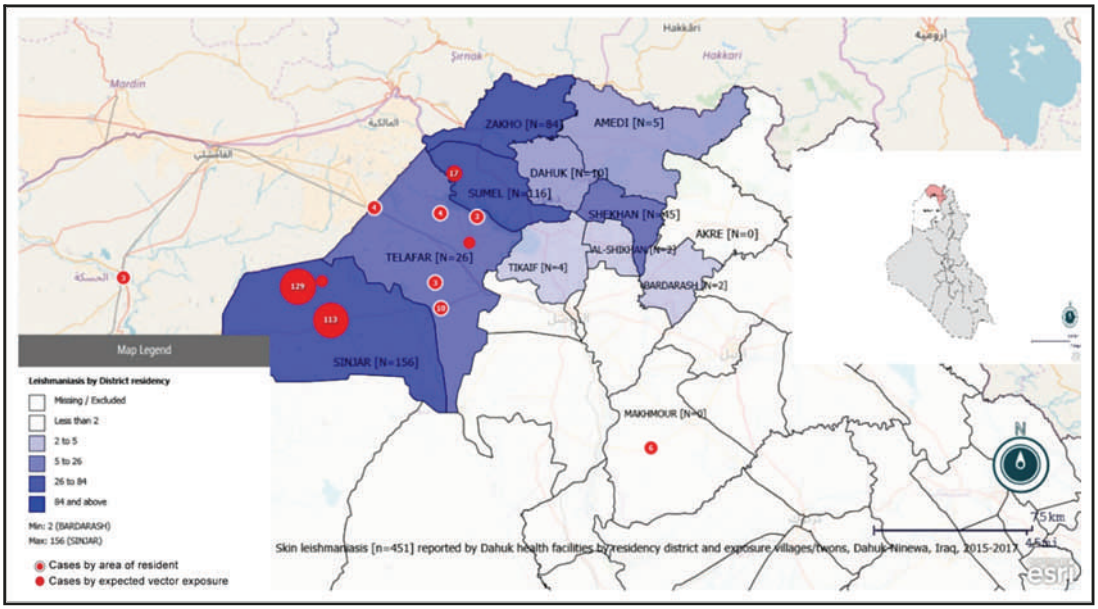

Figure 4: Cases of CL by area of resident during diagnosis (n=450) and by expected vector exposure (n=298).

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border areas of possible vector presence. This was later extended include all IDPs and refugee camps (Dr. Sirwan Aswad, personal communication, 15,2,2019, Director of DPHD, Duhok general directorate of health). The disease is not endemic in Duhok. The study involved 451 cases of CL diagnosed in Duhok hospitals and registered in the DPHD, during 2015-2017. This, however, represented part of the epidemic reported among IDPs. The records of DPHD showed that 2749 cases of CL were recorded among IDPs, during the study period. The reason for not including all registered cases is the lack of information about them and the diagnosis which was carried outside Duhok health facilities. The DPHD followed the guidelines of the national surveillance system which in 2015 reclassified the reporting of CL from only weekly and monthly reportable disease to an immediately notifiable disease if occurred among IDPs or refugees (Dr. Kawa Ameen, personal communication, 2,12,2018, CDC manager, DPHD, Duhok general directorate of health). The health authority of Ninewa has moved temporally to Duhok during that period, and the diagnosis of the other cases was made by their doctors or NGOs doctors among military forces or IDPs in camps directed by them. Most of those case where registered just by name, with no forms available, in order to get the supply of medicine, Sodium Stiboguconate (Pentostam™), which was entirely distributed by DPHD for all cases in Duhok and Ninewa.[7] Accordingly, the outbreak might have been more significant if all cases were to be included. The diagnosis was made clinically by dermatologists. This might not be considered as a limitation as in endemic areas the disease is largely diagnosed by its clinical appearance.[12] Several cases had multiple lesions with a mean number and SD of 3.56 ± 4.23. This might indicate low immunity to CL among IDPs. Similarly, in Hawija region in Iraq, 58% of the cases had multiple lesions,[13] and is the nearby governorate Erbil 66% of cases were suffering from multiple lesion.[14] The mean age and SD was 22.7 ± 17.1 years. Similarly, in a study conducted in Erbil, August 2016- August 2017, the mean age ± SD was 30.7±11.3 years.[15] There was an approximately similar distribution of cases between genders. Similar results have been reported in other studies.[12,15] A wide age range was found among cases. This is expected as the disease can affect any vulnerable person, irrespective to age.[13,15,16] The cumulative data analysis indicates that November was the month when the outbreak started, and the peak was recorded in October. The incubation period of the disease is 2-4 months[1]. This might indicate that the majority of cases were probably bitten by the sand fly in their area of residence or during their way of massive displacement during the summer of 2014. Similarly, November was the month where cases start to increase in a study conducted in Garmian in Kurdistan region, but the peck was in January and February. Closely similar results were found In Erbil during the same period.[15,17] All, except 17 cases indicated a suspected vector exposure outside Duhok. Similar results were found in Erbil, indicating that the disease is still not endemic in Kurdistan region.[13] Only 17 cases diagnosed in Sumel district of Duhok and gave no history of travel to other areas. The spot was adjacent to the district of Telafar in Nineveh governorate, an area known to be endemic in CL where the Tigris river is separating both areas. One possibility is the vector flew over the river. This needs further study as the vector is a weak flier of about a few hundred meters from breeding sites, which might be just enough to reach the suspected destination.[18] Another possibility that there might be endemic foci in that area. Similar results have been reported in a border area between a non-endemic Garmian area/ Kurdistan region and an adjust endemic area in the central region of Iraq.[16] In a study in Erbil nearly three quarters of patients gave a history

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of possible vector contact in endemic areas.[17]

Conclusion

Despite the significant outbreak among IDPs the disease has not yet become endemic in Kurdistan. Close surveillance of vector and reservoir is needed to monitor the epidemiology of the disease.

Competing interests

The authors declare no competing interests.

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