





This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.

Trend, Incidence, Distribution, and Other Epidemiological Aspects of Cutaneous Leishmaniasis in Ilam Province-Iran From 2014 to 2017

Reza Jorvand¹ , Rahmat Chatripour² , Ali Jaliliyan³ , Salman Khazaei⁴ , Yousef Veisani⁵ 

ABSTRACT

This study was conducted to evaluate the incidence rate as well as demographic and clinical characteristics of Cutaneous Leishmaniasis (CL) cases from 2014 to 2017 in Ilam province. In this registry-based descriptive study, the information from 4697 treated patients, who were diagnosed with CL from 2014 to 2017 in Ilam province and enrolled in this study, was used. Data were analyzed using SPSS software version 22. The incidence rate of CL in the years of 2014, 2015, 2016, and 2017 was 269.6, 244.4, 182.7 and 133.4 per 100,000, respectively, that indicating a downward trend in the rate of disease ($p < 0.001$). Mehran and Dehloran counties had highest incidence rate (1208.1 and 227.3 per 100,000, respectively). The results of the present study indicating the high incidence rate of CL in Ilam province.

Keywords: Cutaneous leishmaniasis, incidence, epidemiology, Ilam

INTRODUCTION

According to the World Health Organization (WHO) reports, Leishmaniasis has become endemic in 88 countries (66 countries in Asia and Africa and four countries in Europe and the US (1, 2) and, also more than 70% of new cases have been reported from Afghanistan, Algeria, Colombia, Brazil, Iran, Syria, Ethiopia, North Sudan, Costa Rica and Peru (3).

The prevalence of Leishmaniasis in Iran is increasing, and annually, the cases of the disease are reported from different parts of the country; main focal regions of wet-type leishmaniasis involve villages of Isfahan, Khuzestan, Ilam, and northeast of Iran while main focal regions of dry-type leishmaniasis involve some big and small cities, such as Mashhad, Tehran, Shiraz, Kerman, Bam, Yazd, and Neyshabur (4, 5). According to official reports from the Ministry of Health and Medical Education, the average incidence rate of CL is usually between 20 to 40 per 100,000 populations, and average more than 150 cases per 100,000 population was reported in endemic areas, including Yazd, Semnan, Fars, Ilam, Khuzestan and Isfahan (6).

In recent years, Ilam province can see the upward trend in the incidence of disease, especially in the southern areas of the province (7); As CL is a serious health problem in Iran, conducting epidemiological studies to define control interventions has become increasingly important. Therefore, since the high incidence of CL in Ilam, the current study was conducted to examine the epidemiological aspects of CL from the years 2014 to 2017 in Ilam province.

MATERIALS and METHODS

Research Setting

Ilam province, as one of the endemic centers of CL, with an estimated population of 600,000, is located in southwestern Iran (Fig. 1).

Study Design and Data Collection

In the present registry-based cross-sectional study, all patients with CL who were diagnosed and treated in health centers affiliated to the Ilam University of Medical Sciences from January 2014 to December 2017 were included. In this study, the main included variables were diagnosis year, sex, place of residence (town or village), county of residence, and type of Leishmaniasis. Data were collected using a checklist extracted from the medical records of treated patients. Duplicate cases, incomplete cases, and cases without physician approval were excluded from this study.

Statistical Analysis

Statistical analysis of data was carried out using SPSS software version 22. The incidence rate of the disease was calculated for different counties distinctly in 100,000 populations of Ilam province, based on year and sex, and to describe data, tables and graphs. The significance level was considered less than 0.05.

Cite this article as:

Jorvand R, Chatripour R, Jaliliyan A, Khazaei S, Veisani Y. Trend, Incidence, Distribution, and Other Epidemiological Aspects of Cutaneous Leishmaniasis in Ilam Province-Iran From 2014 to 2017. Erciyas Med J 2020; 42(3): 329-32.

¹Department of Public Health, Faculty of Health, Ilam University of Medical Sciences, Ilam, Iran

²Division of Health Education and Health Promotion, Department of Public Health, Esfahan University of Medical Sciences, Isfahan, Iran

³Department of Entomology, Faculty of Health, Ilam University of Medical Sciences, Ilam, Iran

⁴Research Center for Health Sciences Hamadan University of Medical Sciences, Hamadan, Iran

⁵Zoonotic Diseases Research Center, Ilam University of Medical Sciences, Ilam, Iran

Submitted
14.12.2019

Accepted
09.03.2020

Available Online Date
17.06.2020

Correspondence

Yousef Veisani,
Ilam University of Medical Sciences, Zoonotic Diseases Research Center, Ilam, Iran
Phone: +98 8432227132
e-mail:
yousefveisani@yahoo.com

Table 1. incidence rate of Leishmania by gender in Ilam province between 2014 to 2017

Gender	Year	Country-side's												Total										
		Abdanan		Badreh		Dare Shahr		Dehloran		Eyvan		Ilam		Malekshahi		Mehran		Shirvan Chardavol		Sirvan				
		N	Rate*	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	
Male	Year	2014	30	123.1	0	-	22	94.3	397	1165.3	61	245.3	77	64.1	10	94.8	331	2162.1	25	85.1	1	13.6	954	322.1
		2015	107	439.3	2	25.8	33	147.9	230	675.1	33	132.7	90	75.2	28	265.4	212	1385.2	28	95.3	0	-	763	258.4
		2016	12	49.2	5	64.5	13	58.2	121	355.1	34	136.7	95	79.3	19	180.1	358	2338.9	9	30.6	0	-	666	233.5
		2017	17	69.8	3	38.7	13	58.1	123	361.0	57	229.2	35	29.8	23	218.0	210	1372.0	16	54.4	1	13.2	498	168.6
		2014	13	55.3	0	-	7	32.7	286	906.1	10	40.6	20	17.3	8	75.5	258	1780.4	5	17.8	0	-	607	213.2
2015	77	327.6	0	-	31	144.8	180	570.3	13	52.7	42	36.6	16	151.0	170	1173.1	9	32.1	1	14.1	539	189.1		
2016	9	38.2	1	12.7	0	-	85	269.3	11	44.6	53	44.5	10	94.4	222	1531.9	3	10.7	0	-	394	138.1		
2017	9	37.9	0	-	2	9.3	59	186.9	27	109.6	21	18.1	6	56.6	150	1035.1	2	7.1	0	-	276	96.8		
Total	Year	2014	43	89.8	0	-	29	66.3	683	1040.6	71	143.4	97	41.2	18	85.1	589	1976.6	30	52.2	1	6.9	1561	269.6
		2015	184	384.5	2	12.8	64	146.2	410	624.7	46	92.9	132	56.1	44	208.1	382	1282.0	37	64.4	1	6.7	1302	244.4
		2016	21	43.8	6	38.4	13	29.7	206	313.8	45	90.9	148	62.9	29	137.9	580	1946.5	12	20.9	0	-	1060	182.7
		2017	26	54.3	3	19.2	15	34.3	182	277.3	84	169.7	56	23.8	29	136.8	360	1208.1	18	31.3	1	6.5	774	133.4
		2014	43	89.8	0	-	29	66.3	683	1040.6	71	143.4	97	41.2	18	85.1	589	1976.6	30	52.2	1	6.9	1561	269.6

*per 100,000 population

RESULTS

The incidence rates of CL per 100,000 people in the 10 countryside were shown in both genders in Table 1. The incidence rates for 2014–2017 were 322.1, 258.1, 233.5, and 168.6 per 100,000 for males and 213.2, 189.1, 138.1, and 96.8 per 100,000 for females. According to this, the highest incidence rate was in 2014 for both genders. Among the 10 countryside's in Ilam province, Malekshahi and Mehran had the highest incidence rate, the incidence rate in Mehran was 1976.6, 1282.0, 1946.5, and 1208.1 during 2014–2017, respectively. The total incidence rates were 269.6, 244.6, 182.7, and 133.4 per 100,000 populations from 2014 to 2017. Also, we found that *L. major* was more prevalent than *L. tropica* in all ages in the Ilam province in the study period (Fig. 2).

We compared the incidence rate in females and males over the study period, and according to our results, the incidence rate was statistically decreasing in both genders. Thus, in 2017, it has reached its lowest level (Fig. 3).

DISCUSSION

The results of this study showed that the highest incidence of CL in Ilam province occurred in 2014 (269.6 per 100,000 populations), and the number of infected cases gradually decreased to 133.4 per 100,000 populations in 2017. The downward was shown in previous studies (4, 6). The downward trend possibly will be due to interventional measures, such as rodent elimination, general education, or reduction of the population susceptible to Leishmaniasis.

Another notable finding in this study was that, in 2014, we had an outbreak of CL in some counties of Ilam province. The incidence rate of CL in Mehran and Dehloran counties were 2162.1 and 1165.3 per 100,000, respectively, which is 20–50 times higher than the national average (8). The high incidence rate of CL depends on a variety of factors, including climate change, natural disasters, war, marginalization, excessive wastes of building construction, inadequate environmental improvements and inadequate control measures. The results of this study indicate a high incidence of the disease, especially in 2014. From 2011 to 2014, a series of earthquakes occurred in the Ilam province, with the maximum number of earthquakes occurring between 2013 to 2014 (9). This paved the way for the transfer of rodents to cities and villages and created an environment conducive to the vector propagation. Furthermore, due to fear of earthquakes, people left out of their homes, especially at night, which is pick time of being bitten by flies, and this may have been associated with an increased incidence of the disease.

CONCLUSION

The results of this study showed a high incidence rate of CL in Ilam province, especially in 2014. Therefore, preventive interventions, such as environmental improvement, raising awareness of the undercover population, controlling the carrier and disease reservoir, as well as considering their role in the disease control and preventing its spread to other areas is recommended.



Figure 1. Geographic location of the Ilam province in the Iran

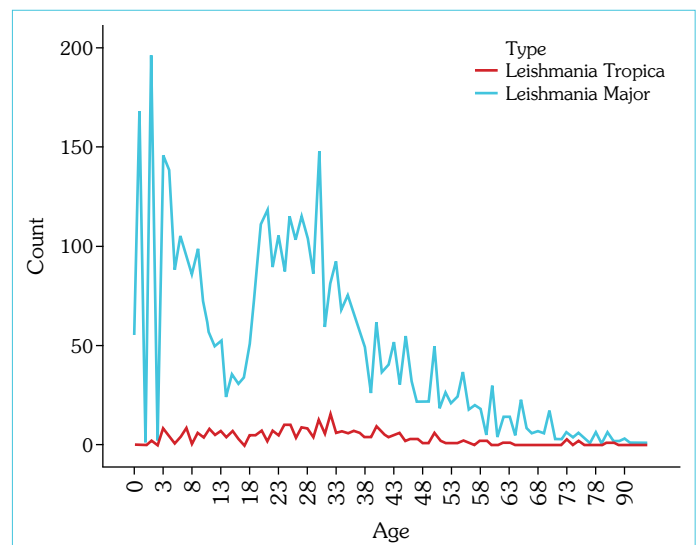


Figure 2. The distribution of cutaneous leishmania type according to age for both types; *L. tropica* and *L. major*



Figure 3. Trend of the incidence rate of cutaneous leishmania in the Ilam province, 2014 to 2017, by gender

Acknowledgements: The authors would like to thank the CDC in the Health Department of the Ilam University of Medical Sciences for their cooperation.

Ethics Committee Approval: Ethics approval for this study was given by the Ethics Committee of the Ilam University of Medical Sciences on 15 October 2016 under the Reference Code ir.medilam.rec.1395.93.

Informed Consent: Written informed consent was obtained from patients who participated in this study.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – RJ, YV; Design – YV, AJ; Data Collection and/or Processing – RJ, RC, SK; Analysis and/or Interpretation – YV, RJ; Literature Search – YV; Writing – SK, RJ; Critical Reviews – RJ, RC, AJ, SK, YV.

Conflict of Interest: The authors have no conflict of interest to declare.

Financial Disclosure: We thank our colleagues from Ilam University of Medical Sciences that sponsored this project financially.

REFERENCES

- Mohammadpour I, Hatam GR, Handjani F, Bozorg-Ghalati F, PourKamal D, Motazedian MH. Leishmania cytochrome b gene sequence polymorphisms in southern Iran: relationships with different cutaneous clinical manifestations. *BMC Infect Dis.* 2019;19(1):98. [\[CrossRef\]](#)
- Quaresma PF, de Brito CFA, Rugani JMN, Freire JM, Baptista RP, Moreno EC, et al. Distinct genetic profiles of Leishmania (Viannia) braziliensis associate with clinical variations in cutaneous-leishmaniasis patients from an endemic area in Brazil. *Parasitology* 2018; 145(9): 1161–9. [\[CrossRef\]](#)
- Heras-Mosteiro J, Monge-Maillo B, Pinart M, Lopez Pereira P, Reveiz L, Garcia-Carrasco E, et al. Interventions for Old World cutaneous leishmaniasis. *Cochrane Database Syst Rev.* 2017; 11(11): CD005067. [\[CrossRef\]](#)
- Sakhaei S, Darrudi R, Motaarefi H, Sadagheyani HE. Epidemiological Study of Cutaneous Leishmaniasis in Neyshabur County, East of Iran (2011-2017). *Open Access Macedonian J Med Scie* 2019; 7(21): 3710–5. [\[CrossRef\]](#)
- Soltani S, Foroutan M, Hezarian M, Afshari H, Kahvaz MS. Cutaneous leishmaniasis: an epidemiological study in southwest of Iran. *J Parasit Dis* 2019; 43(2): 190–7. [\[CrossRef\]](#)
- Saghafipour A, Vatandoost H, Zahraei-Ramazani AR, Yaghoobi-Ershadi MR, Jooshin MK, Rassi Y, et al. Epidemiological Study on Cutaneous Leishmaniasis in an Endemic Area, of Qom Province, Central Iran. *J Arthropod Borne Dis* 2017; 11(3): 403–13.
- Abedi-Astaneh F, Hajjaran H, Yaghoobi-Ershadi MR, Hanafi-Bojd AA, Mohebbali M, Shirzadi MR, et al. Risk Mapping and Situational Analysis of Cutaneous Leishmaniasis in an Endemic Area of Central Iran: A GIS-Based Survey. *PLoS One* 2016; 11(8): e0161317. [\[CrossRef\]](#)
- Holakouie-Naieni K, Mostafavi E, Bolorani AD, Mohebbali M, Pakzad R. Spatial modeling of cutaneous leishmaniasis in Iran from 1983 to 2013. *Acta Trop* 2017; 166: 67–73. [\[CrossRef\]](#)
- Kintner JA, Ammon CJ, Cleveland KM, Herman M. Rupture processes of the 2013–2014 Minab earthquake sequence, Iran. *Geophysical J Int* 2018; 213(3): 1898–911. [\[CrossRef\]](#)