Original Article

Epidemiological pattern of Cutaneous Leishmaniasis in the province of Fars, Iran (2010-2014)

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Abstract

Introduction: Cutaneous Leishmaniasis is considered as an important health problem in Iran. This disease begins as small papules and then they gradually grow and turn into wounds. Since the epidemiological study of this problem is effective in preventing and controlling it, the current research was conducted on epidemiological pattern of Cutaneous Leishmaniasis in the province of Fars, Iran (2010-2014)

Materials and Methods: This cross-sectional study was conducted on the registered information (20601 patients) and documents of the patients having problem in Fars province remedial and health care centers over the last 5 years. First, the registered demographic and epidemiological data of patients were extracted and then analyzed through by using SPSS software.

Results: A total of 20601 patients including 10607 males (51%) and 9994 females (49%) participated this study. Patients were in the age range of 20-29 years old and minority of them was 5-9 years old. Most lesions were on the hand and leg of the patients. It was also found that there was a significant relationship between age groups and types of Leishmaniasis ($P<0.05$) as well as gender and type of Cutaneous Leishmaniasis ($P<0.05$).

Conclusion: According to this is investigation, there was an ascending trend in disease frequency which was based on the descending process. This indicates promotion of educational- hygiene status as well as observance of personal hygiene principals.

Keywords: Frequency, Cutaneous Leishmaniasis, Epidemiology, Fars Province.

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Introduction

Cutaneous Leishmaniasis (CL) is a zoonotic parasitic disease that is caused by the obligate and flagellates intracellular protozoan and the bites of mosquitoes in humans. Leishmaniasis endemic (native) is detected in 88 countries of 4 continents (22) countries in Europe and America, 66 Asian and African countries) and is considered as the most important tropical and subtropical diseases after malaria [1, 2, 3]. Now there are 12 million people infected with Leishmania in the world. Two million new cases occur every year, half a million of which further, are visceral diseases and 5.1 million cases are cutaneous diseases. 90% of Cutaneous Leishmaniasis occurs in seven countries: Afghanistan, Algeria, Brazil, Iran, Peru, Saudi Arabia and Syria. It is a skin infection caused by a parasitic protozoa transmitted by the bite of a Phlebotomus, i.e. a sand fly (Phlebotomus Papatasi) that lives usually in forests, caves and small nests [4,5]. This disease is one of the most important and most common endemic diseases in Iran [6, 7] and the second transmissible parasitic disease by arthropods after malaria that is in observed Anthroponotic Cutaneous Leishmaniasis (ACL) and Zoonotic Cutaneous Leishmaniasis (ZCL) form. About 20 thousand cases of Cutaneous Leishmaniasis are reported from different parts of country but the true extent has been estimated more than the reported extent. Leishmaniasis in Iran arises as a major health problem. The prevalence of Cutaneous Leishmaniasis in Iran has been increasing, so the number of positive cases in 2005 has increased 105% compared to 2001. The disease is prevalent in southern Khorasan, Fars, Isfahan, Khuzestan, Kerman, Ilam and Bushehr provinces. Yazd has the highest rate of new cases in recent years. Generally, provinces such as Yazd, Tehran, Khorasan, Fars, Ilam, Khuzestan and Esfahan with an average incidence of 166 cases per 100 thousand people have the highest incidence of this disease while the western and northwest provinces of Iran have the lowest incidence of CL (less than 10 cases per hundred thousand). The disease imposes economic burden on families, communities, and countries, particularly developing countries. Moreover application of antimony 5 Capacity (Glucantime) as an expensive drug which requires multiple injections in specific time intervals for treatment is another problem. Additionally, Parasite resistance to this drug is common and local injection of medication around the wound is painful. The diverse and important side effects such as arrhythmia, pancreatic liver enzymes, leucopenia, anemia, thrombocytopenia, cardiac toxicity and sudden death is rare [8, 9, 10]. Given that epidemiological studies for disease control and preventive measures are effective, this survey was designed on epidemiological pattern of Cutaneous Leishmaniasis in the province of Fars, Iran (2010-2014).

Materials and Methods

This descriptive and cross-sectional study was conducted to investigate the epidemiology of

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Leishmaniasis in Fars province. In coordination with Fars University of medical sciences the recorded information of patients including age, sex, geographic area, type of Leishmaniasis, and the number of lesions were extracted. The population consisted all people who had been treated from beginning of April 2010 to March 2014 by Leishmaniasis diagnosis of suspicious lesions sampling, preparation Smear and clinical laboratory confirmation at health and medicinal centers. After collecting information, data were analyzed by SPSS software version 18 through descriptive statistics and chi-square test. The statistical significance level was considered less than 0.05.

Results

Described of this study on 20601 positive cases of CL in terms of age category, according to (Table 1) shows that the highest age category infected by CL was in the range of 20 -29 years with 3971 cases (19%). Followed by 30 - 39 age range consisting of 3430 cases (16%). and 5 - 9 years old age group with 1971 case (0.09%). The CL frequency of cases terms of gender was 10607 men (51%) and 9994 women (49%) during 2011 to 2014, it is worth noting that year of 2011 had the most patients with CL,2613 men (12%) and 2323 women (11%) (Table 1). The majority of CL patients. 7407 people (35%), had infected on their hands (Table III). A survey conducted on the geographical of CL incidence indicates that, the Northern and central provinces with respectively 7378 (35%) and 6392 (31%) patients were the most affected areas (Table 3). Most patients with CL in terms of jobs was from homemaker 5809 patients (28%) and children in 2833 patients (13%) (Table 3). Most CL patients were house keepers.5809 patients (28%) and children 2833 (13%) (Table 2). Table 2 shows a comparison of CL with 12028 patients (58%) ACL with 8573 patients (42%). Analytic tests represented that there is a significant difference between the gender of the participants and the type of Leishmaniasis (P <0/05). A significant difference also was observed between age categories and the type of Leishmaniasis (P <0/05), and finally Linear regression population from 2010 to 2014 (Fig. 1).

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Table 1. The frequency of CL by age and gender

	Year	2010	2011	2012	2013	2014	Total
Age/Gender		N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Age	0-4	550(20.74)	613(23.11)	463(17.46)	429(16.18)	597(22.51)	2652(100)
	5-9	420(21.28)	417(21.12)	344(17.43)	343(17.38)	450(22.80)	1974 (100)
	10-19	598(24.43)	688(24.65)	485(17.38)	426(15.26)	594(21.98)	2791 (100)
	20-29	918(23.12)	1042(26.24)	509(12.82)	679(17.10)	823(20.73)	3971 (100)
	30-39	619(18.50)	809(28.59)	683(19.91)	542(15.80)	777(22.65)	3430 (100)
	40-49	468 (19.39)	528(21.87)	633(26.22)	213(08.82)	572(23.70)	2414 (100)
	+50	547(16.37)	839(24.90)	478(14.19)	707(20.99)	798(23.69)	3369 (100)
	Total	4120(19.10)	4936(22.01)	3595(17.45)	3339(16.20)	4611(22.38)	20601 (100)
Gender	Male	2153(20.30)	2613(24.63)	1827(17.24)	1716(16.67)	2298(21.66)	10607 (100)
	Female	1967(19.69)	2323(23.24)	1768(17.70)	1623(16.24)	2313(23.14)	9994 (100)
	Total	4120(19.10)	4936(23.96)	3595(17.45)	3339(16.21)	4611(23.38)	20601(100)
	Pearson Chi-squire test			p=0.03		p=0.001	

Table 2. The frequency and type of CL by season and type of CL

	Year	2010	2011	2012	2013	2014	Total
		N	N	N	N	N	N
Season	Autumn	2164	2684	2007	1806	2635	11296
	Winter	1012	1446	894	1137	1194	5683
	Summer	517	599	427	248	595	2386
	Spring	427	207	267	148	187	1236
	Total	4120	4936	3595	3339	4611	2060
Type of	ZCL	2712	3210	1783	1832	2491	12028
Cutaneous	ACL	1408	1726	1812	1507	2120	8573
Leishmaniasis	Total	4120	4936	3595	3339	4611	20601
	Pearson Chi-squire test				p=0.001		

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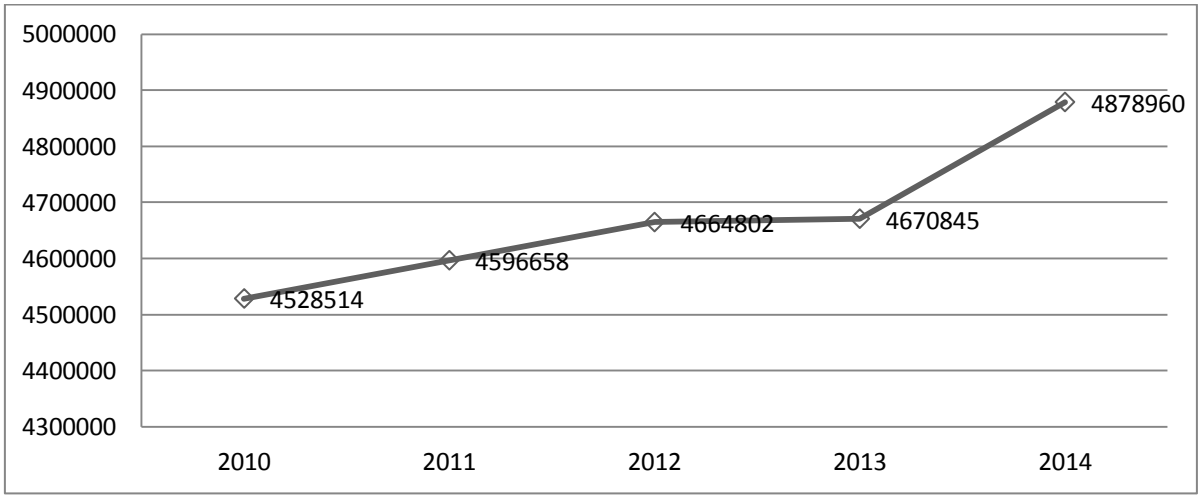
Table 3. The frequency of CL by jobs, geographic areas and type of Lesion

	Year	2010 N (%)	2011 N (%)	2012 N (%)	2013 N (%)	2014 N (%)	Total N (%)
Job	Child	696(18.16)	1045(27.50)	684(17.85)	592(15.44)	816(21.29)	3833(100)
	Student	688(11.84)	1491(25.67)	1201(20.67)	994(17.11)	1435(24.70)	5809 (100)
	Housewife	672(18.72)	969(25.10)	603(16.80)	545(15.18)	801 (23.31)	3590 (100)
	Farm-Rancher	656 (25.59)	383(19.03)	321(15.94)	331(16.44)	322(15.10)	2013 (100)
	Other jobs	396 (17.20)	579(25.15)	276(19.99)	445(19.77)	606(26.32)	2302 (100)
	Unemployed	297(50.56)	072(12.33)	070(11.99)	093(12.92)	052(08.90)	584 (100)
	Worker	365 (28.85)	179 (14.20)	232(18.40)	189(14.10)	296(23.47)	1261 (100)
	Driver	291(39.06)	145 (19.46)	067(09.99)	106(12.23)	136(18.26)	745 (100)
	Employee	059(12.72)	073 (15.73)	087 (18.75)	098(21.12)	147(31.68)	464 (100)
	Total	4120(19.10)	4936(23.96)	3595(08.13)	3339(16.4)	4611(22.38)	20601(100)
Geograp areas	Central	1516(23.72)	1675(26.20)	817(12.78)	862 (2240)	1522(23.81)	6392 (100)
	North	1256(17.02)	1535(20.81)	1689(13.49)	143(20.81)	1466(19.87)	7378 (100)
	South	486(19.62)	650(19.93)	469(18.93)	353(14.25)	519 (20.99)	2477 (100)
	East	423 (18.90)	553 (24.71)	344(15.37)	355(15.86)	563 (25.16)	2238 (100)
	The West	439(20.75)	523(24.72)	276 (13.04)	337(16.93)	541(25.57)	2116 (100)
	Total	4120(19.10)	4936(20.97)	3595(17.45)	3339(16.9)	4611(22.38)	20601(100)
Lesion	Leg	1128(17.63)	1615(24.25)	1224(19.13)	1051(16.4)	1379(21.56)	6397 (100)
	The face	547(14.34)	850(22.29)	576(15.10)	677(17.75)	1164(30.52)	3814 (100)
	Hand	1565(21.13)	1746(23.57)	1252(16.90)	1234(16.6)	1610(21.74)	7407 (100)
	Ankle	423(29.23)	342(23.64)	246(17.00)	220(15.20)	216(19.93)	1447 (100)
	Arm	286(30.30)	235 (24.89)	137(14.52)	141(14.94)	145(15.36)	944 (100)
	Head	171(28.89)	148(25.00)	106(17.91)	070(11.82)	097 (16.39)	592 (100)
	Total	4120(19.10)	4936(23.96)	3595(17.45)	3339(16.2)	4611(22.38)	20601(100)
	Pearson Chi-squire test		p=067	p=0.054		p=0.001	

Fig. 1. Linear regression population from 2010 to 2014



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Discussion

This study aimed to investigate the epidemiology of people infected by CL in Fars province based on the recorded information from health and medicinal centers in coordination with Fars University of Medical Sciences from beginning of April 2010 to March 2014. Our results showed that the majority of Leishmaniasis patients were the age of 20- 29 and minority of them were in the 5- 9 years. Also, 51% of patients with Cutaneous Leishmaniasis were male and 49% of them were female. Prevalence of CL reached its highest point in 2011 with the most number of patients, and the most part of patients, body infected by CL was the hand area with a prevalence of 35% and then followed by legs with 31% and other organs by 23 %. The studied cases with ACL and ZCL with 12028 patients (58%) were much higher compared to ACL with 8573 patients (42%). Results showed a significant difference between age categories and types of Leishmaniasis, (p <0/05). The highest frequency was observed in the age group of 20- 29 years. CL in north of Fars province had the most number of cases, i. e. 7378 patients (35%) in terms of geographical location. Most patients with CL in terms of job category were housekeepers: 5809 patients (28%). Fall season had the highest number of infection cases with 11296 people (54 %). Doroodgar et al. showed that most patients with CL were in the age category 20- 29 years [11]. Youssefi et al. 2010 represented that most cases of CL were in the age range of 20- 29 years [12]. Dluee et al, 2011, showed that the 20- 30 years are highest prevalence of CL [13]. Almaasi et al. in a study on CL in the city of Shiraz reported that the highest reported that the highest prevalence was at the age category15-30[14]. Heravi et al. (2013), reported that the 15- 30 age group had the highest CL prevalence [15]. Sofizadeh et al. (2011), indicated that 55.3 % of the total number of 1799 patients, were males and 44.7 % were females [16] . In another research conducted by Bahrami and Momeni, prevalence of CL in men was higher than women while Ayatollahi et al. (2006) in Abarkouh, Yazd showed that the number of female patients with CL was higher than men, which is consistent with our study. The higher prevalence percentage of men to women could be due to less security, jobs, lighter clothes, warm climate area, and contact with sand flies [17,18,19]. All results of these studies are consistent. The test results represented a significant difference between the age and gender of participants, and the type of Leishmaniasis (p <0/05). A study by the Tohidi et al. (2010), in Golestan province showed that zoonotic CL had more cases than Anthroponotic CL [20]. In Ayatollahi et al. studied 1006 patients with Cutaneous Leishmaniasis in Abarkouh Yazd reported that 66.44% of patients had wet ZCL [19].

In a research conducted in Haji Abad, Hormozgan , Hanafi Bjad et. El.showed that ZCL was more than ACL [21]. Mohammadi Azni et al. in Damghan also showed that ZCL prevalence was 68.2 % while that of ACL was

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31.8 % [22]. Ranjbar Totoei et al. reported that in Rafsanjan 55.8% of cases of CL disease were in upper body organs of hand and face [23]. Saghafi pour et al. in Qom province indicated that 49.08% of infection cases were in the hands [24]. In Nazari study Hamadan 50.6% of lesions were also in hands [25]. Ramzani et al. in the city of Aran Bidgol showed that housewife and worker category had the most cases with CL [26]. Tashrifi et al. in Esfarayen showed that the most infected category was housewives and children [27]. Hamzavi et al. in Kermanshah province acknowledged that housewives class with 32 % and also autumn season by 35 % had the highest infection of CL [28]. Karimian et al. in Mashhad also showed that autumn season was the most common season of Leishmaniasis infection with 40% [29]. Kazeruni et al. investigated CL distribution in Fars province concluded that the northern part of Fars province has the highest pollution [30]. Sharafi et al. in the north of Khorram Abad in the Lorestan province has more CL cases than other areas [31]. These results are also in the same path with our study. Our study indicated an increasing CL trend over the past 5 years in all factors such as age, gender, lesion, and type of Leishmaniasis, ZCL, ACL, season and jobs in Fars province. Therefore, monthly training programs provided by health center found to reduce the level of literacy, for example, correct garbage disposal, mosquito nets, etc. are the main reasons for the increase in disease.

Conclusion

This study indicates an upward trend of CL from 2010 to2014 in Fars province. Increased Leishmaniasis in this area can caused due to the following reasons people's level of health education, lack of personal and social hygiene. Existence of agricultural fertilizers near residential areas, contacts with livestock animals in the house, and so on.

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Conflict of Interest

This study had no conflict of interest for authors.

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