International Journal of Advanced Biotechnology and Research (IJBR)
ISSN 0976-2612, Online ISSN 2278–599X,
Vol-8, Issue-3, 2017, pp2029-2040
http://www.bipublication.com

Research Article

Demographic Description and the Effects of Cutaneous Leishmaniasis Treatment in the south of Ilam province between 2010-2015, Iran

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ABSTRACT:

Cutaneous leishmaniasis is an important skin disease caused by a protozoan known as Leishmanis. It is one of the six important parasitic diseases in the world and occurs as endemic form in tropical and sub -tropical regions of the world. The purpose of this study is to investigate the effects of treatment and treatment selection according to the lesions properties in south of Ilam province between 2010 and 2015.In this cross-sectional study, data were collected from 3638 patients with Cutaneous leishmaniasis during 2010-2015 whose information were recorded at the health center of the province. SPSS vol.21 software was used to analyze the data.

Out of 3638 patients suffering from leishmaniosis, 60.80% were male. The age group under 10 years old showed the highest incidence rate. 39.44% of the patients were treated with intramuscular Glucantime injection 35.34% with intralesional Glucantime injection, 16.44% with cryotherapy, and 7.59% with cryotherapy and Intralesional Glucantime injection. There was a significant relationship between the number of lesions, the shape and size of the lesions and the treatment method selection ($p < 0.001$).

Among 3596 treated patients, 37.43% were recovered completely without any complications, 56.92% reported to be recovering and patients were seemingly less likely to be affected by serious lesions.

Key words: Cutaneous leishmaniasis Treatment, Iran

INTRODUCTION:

Cutaneous leishmaniosis is an important skin disease caused by a protozoan named leishmania (1). World Health Organization (WHO) has categorized this disease amongst the six important diseases in tropical and sub-tropical regions due to the health importance (2). According to WHO reports, Leishmaniasis is endemic in 98 countries worldwide and more than 90% of new cases of leishmaniosis occurred in 6 countries of Brazil, Ethiopia, India, Somalia, South Sudan, and Sudan in 2014, Ninty percent of cases with cutaneous forms of leishmaniasis occur in Afghanistan, Algeria, Brazil, Iran, Peru, Saudi Arabia and Syria. It has currently affected 14 million people in the world and 350 million people are at risk to be affected by leishmaniosis and about 1 to 2.5 million of new cases occurs annually (3-5). Iran is one of the main centers of cutaneous leishmaniosis in the world and this disease occurs in the two forms of urban (Dry-Type) and rural (Wet-Type) leishmaniosis (1). According to WHO reports, the estimated number of leishmaniosis infection in Iran ranged

from 69,000 to 113,000 cases per year in 2012 (6). According to the statistics in 2008, more than 26,000 cases of leishmaniosis infection with a prevalence rate of 37 per 100,000 people have been recorded in Iran, which this figure has reached to 20585 cases with a prevalence rate of 27 per 100,000 people in 2011. More than 90% of cases occurred in 88 cities and the transmission of the disease takes place in 17 provinces.

Ilam province is one of the major centers of the disease in Iran. Most of cases of the disease were reported from Ilam province and Fars province, and the least cases were reported from Mazandaran province (3,7). Although this disease disappears by itself, it becomes chronic in 10% of the cases where the treatment is required. On the other hand, unpleasant lesions caused by the disease, particularly in the face, is problematic regarding the beauty and can leave deep psychological effects on the affected person (8-10). In addition, because of the problems with the control of this disease, such as variety of the insect (sand fly) vector and a number of mammals as the disease reservoirs, the lack of achieving to an effective vaccine and finding an efficient drug is very important (11).

Various treatments have been studied for this disease, which in some cases have poor justification and their effectiveness is less than optimum level. The number of medications indicates that there is no absolute treatment for this disease. Physical treatments include curettage, surgery, Grenz Ray (earlier), thermotherapy, cryotherapy, electrotherapy, and laser.

Topical treatments include paromomycin cream (15%) and intralesional injection of glucantime. Systemic treatments, as the first stage of the treatment against leishmaniosis, include antimony compounds (sodium stibogluconate, meglumine antimoniate).

Other systemic treatments include pentamidine, interferon, allopurinol, rifampin, dapsone, azoles, and immunotherapy. Choosing a diet therapy varies based on the type of parasite, geographical area, and clinical manifestations (9,12).

The treatment methods used in Iran are done according to the decision of National Committee for standard treatment of cutaneous leishmaniosis based on the type of cutaneous leishmaniosis, size of lesion, location of lesion, number of lesions, and the shape of lesion which includes topical treatment as intralesional injection of glucantime, cryotherapy, and combined intralesional injection of glucantime and cryotherapy treatment. Systemic treatment is used as intramuscular injection of glucantime. Glucantime ampoule is presently the common treatment in Iran. Despite the complications and long usage in the country, no side effects has been fully documented and reported of using this medicine (3).

According to treatment guidelines for cutaneous leishmaniosis in Iran, the definitions of the disease based on the infection records and treatment are as follows:

New: A case that has been diagnosed with leishmaniosis for the first time and has never been treated with a specific therapy in the past.

Recurrence: It applies to a case who has previously received a topical or systemic treatment and has been recovered, but the symptoms (any active lesion) have been reappeared in the previous lesion of the patient.

Treatment failure: The presence of an active lesion 4 weeks after complete topical therapy or one complete systemic therapy.

Clinical resistance: In recurrence and treatment failure cases where there is an active lesion 4 weeks after at least two complete systemic therapy, they are considered as clinical resistance cases (to be confirmed as drug resistance, specific laboratory tests are required) (3).

Studies conducted in Ilam province have focused more on epidemiological aspects of cutaneous leishmaniosis disease and have had less concern about treatment results. The purpose of this study is to examine the effects of treatment and choosing the type of treatment according to lesion characteristics in the south of Ilam province, cities of Dehloran, Mehran, Abdanan, and Dareh Shahr during a 5 years period from the March of 2010 to the March of 2015.

Work method:

In this cross-sectional study, data collected from 3638 patients with cutaneous leishmaniosis who had referred to the health centers of Dehloran, Mehran, Abdanan, and Dareh Shahr during the years 2010-2015 and had been diagnosed positive with clinical and laboratory confirmation and their information had been recorded at the provincial health center.

Data collection and analysis method was conducted through patients' records using the recorded data of patients with cutaneous leishmaniosis at the provincial health center. These information include age, sex, job, place of residence (city or village), type of leishmaniosis, area affected by lesion, the date of the disease prevalence, the date of diagnosis, type of treatment, duration of treatment, and duration of the disease.

The treatment methods being examined in this study include systemic meglumine antimoniate injection, meglumine antimoniate intralesional injection, cryotherapy, and cryotherapy and combined meglumine antimoniate intralesional injection therapy.

Cutaneous leishmaniosis occurs based on the shape of the lesion in 4 form of dry, wet, lupoid, and sporotrichoid:

Dry form: It has 4 stages. Initially, it is a red and painless papule that does not vanish with pressure and sometimes has mild itching. After several weeks, the lesion becomes active and larger, it is encircled with a red halo and becomes a as solid lesion due to the accumulation of cells.

After two or three months, papule becomes as red and swollen rashes with smooth and lucid surface and soft tissue. It finally becomes as an open lesion. There are pink haloes around the lesion that look solid compare to its surrounding and lower tissues.

The lesion is painless and sometimes has slight itching. The lesion starts healing from its center. Complete recovery occurs after 6-12 months and sometimes more.

Wet form: It has the same four stages of dry leishmaniosis, but its clinical manifestations are different. The lesion appears as a rash with acute inflammations. It becomes a wound after two weeks and becomes larger very fast, around of it filled with blood. Below the edge of the lesion is empty and the edge has lots of pus. The healing occurs in the middle and surrounding areas at the same time. The lesion is healed usually within 4-6 months.

Lupoid form: Long after the lesion recovery, red maculopapular rashes and nodules around red scars and nodules around the old scars are appeared. These lesions are reactivated from the edge of previous lesion and gradually expanded, which is typically seen in the urban type of leshmaniosis.

Sporotrichoid form: In some cases of skin lesion following leishmaniosis parasite entering into the lymphatic veins and its spread, subcutaneous nodules called sporotrichoid leishmaniosis are generated throughout these veins toward proximal (3).

SPSS vol.21 software and descriptive methods (frequency table, central indices, and dispersion) as well as X^2 and ANOVA tests were used to analyze the data. The significance level of the tests is set at 0.05.

RESULTS:

In this study, data from 3638 patients with cutaneous leishmaniosis in the south of Ilam province, cities of Dehloran, Mehran, Abdanan, and Dareh Shahr during the period of 2010 to the end of 2015 were analyzed. Of this number, 2212 (60.80%) were male with the average age of (±SD) 22.07 ± 15.63 years and 1422 (39.09%) were female with the average age of (±SD) 21.66 ± 17.80 years. 64.87% of the patients lived in cities and 35.05% lived in rural areas.

Over 31.80% (1157 people) were under the age of 10 and 2.47% (90 people) were more than 61 years old. There was a significant relationship between cutaneous leishmaniosis and gender, place of residence and age groups (P<0/05) (Table 1).

Table 1. Demographic characteristics of 3638 patients with cutaneous leishmaniosis in the south of Ilam, Iran, 2010-2015

Frequency of patients (percent)		Years old					
		2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	Total
Sex	Male	64.67	62.97	59.36	59.80	58.30	60.80
	Female	34.78	37.02	40.64	40.20	41.70	39.09
Residence	Urban	57.20	56.05	61.08	69.30	73.52	64.87
	Rural	42.80	43.95	38.92	30.70	26.47	35.05
Age (years)	≤10	27.71	32.13	28.57	28.89	36.04	31.80
	11-20	15.90	14.84	14.78	13.94	12.78	14.18
	21-30	35.19	28.24	28.33	22.63	24.25	27.46
	31-40	10.60	12.25	14.29	10.10	14.54	12.67
	41-50	4.34	6.34	6.89	7.68	6.96	6.40
	51-60	2.45	3.60	4.68	3.23	3.37	3.53
	≥61	3.13	2.60	2.46	2.42	2.07	2.47

During the 5 years period of the study, Dehloran with 1960 people (53.88%) had the largest number of affected cases and Abdanan with 71 people (1.95%) had the lowest number of affected cases (Figure 1).

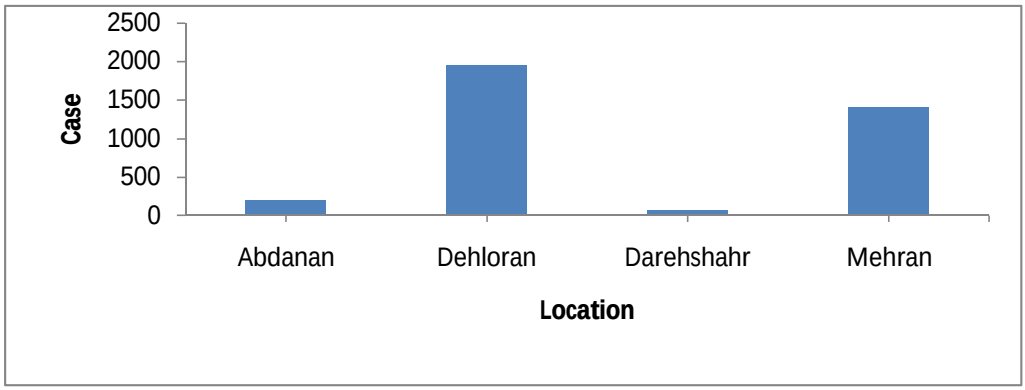

Figure 1. Frequency distribution of cutaneous leishmaniosis cases according to the cities in the south of Ilam, Iran, 2010-2015

In terms of lesion location, the most affected body parts were hands with 52% followed by legs with 22%, torso, head and neck with 9% were the least affected organs. There was a significant relationship between cutaneous leishmaniosis infection and the location of the lesion (P < 0/05) (Figure 2).

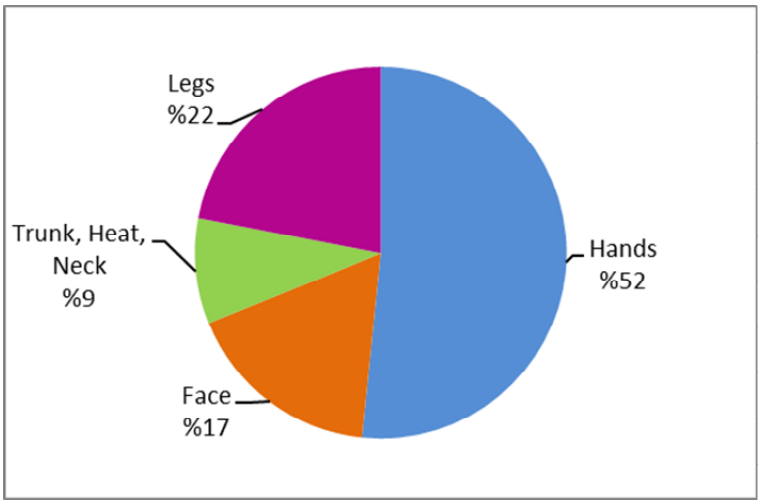

Figure 2. Frequency distribution of cutaneous leishmaniosis cases according to the location of the lesion in the south of Ilam, Iran, 2010-2015

39.44% (1435 people) of the patients were treated with intramuscular injection of glucantime, 35.34% (1287 people) with intralesional injection of glucantime, 16.44% (598 people) with cryotherapy, and 7.59% (276 people) with combined cryotherapy and intralesional injection therapy. During this period, treatment failure was reported in 1 patient treated with intramuscular injection of glucantime and there was no treatment failure in other treatment methods Of 24 patients who were treated intramuscularly, complications were detected in 10 patients treated with intralesional injection and 1 patient treated with combined cryotherapy and intralesional injection. Clinical resistance were reported in 1 patient who received intramuscular injection and 3 patients who received intralesional injection Of 3596 treated patients, 37.43% (1346 people) were fully recovered without any complications and 56.92% (2047 person) were reported to be recovering (Table 2).

Table 2. Frequency distribution of treatment methods in 3638 patients with cutaneous leishmaniosis in the south of Ilam, Iran, 2010-2015

Treatment / outcome of treatment	intramuscular injection of glucantime	Intralesional Injection of Glucantime	Cryotherapy	Cryotherapy & Intralesional Injection of Glucantime
Number (percent)	1435(39.44%)	1287(35.34%)	598(16.44%)	276(7.59%)
Recovered	591	454	192	113
Recovering	725	771	401	156
Treatment failure	1	0	0	0
Clinical resistance	1	3	0	0
Complications of treatment	24	10	0	1

42.06% of the patients had one lesion and 13.78% had more than 4 lesions on their bodies. For 1110 patients who had 1 to 3 lesions, intralesional injection was used, while for 432 patients who had more than 3 lesions, they received intramuscular injection. 43.05% of the patients had dry lesion and 56.32% had wet lesion. 38.44% of the patients had dry lesion treated with intramuscular injection and 47.19% of the patients had wet lesion treated with intralesional injection. In 84.60% of the patients, the size of the lesion was less than 3 cm and in 14.20% it was greater than 3 cm. For 1131 patients whose the size of the lesion was less than 3 cm, intralesional injection was used while 305 patients whose the size of the lesion was greater than 3 cm received intramuscular injection. There was a significant relationship between the number of lesions, the shape of the lesion, the size of the lesion, and choosing the treatment method ($P < 0.001$) (Table 3).

Table 3. The relationship between treatment methods and lesion characteristics in 3638 patients with cutaneous leishmaniosis in the south of Ilam, Iran, 2010-2015

Lesion characteristics		Treatment					P
		intramuscular Injection of Glucantime	Intralesional Injection of Glucantime	Cryotherapy	Cryotherapy & Intralesional Injection of Glucantime	Total	
Number of lesions	**1**	499(32.6%)	608(39.74%)	281(18.34%)	126(8.24%)	1530(42.06%)	<0.001
	2	281(33.94%)	339(40.94%)	137(16.55%)	62(7.45%)	828(22.76%)	
	3	220(43.56%)	163(32.28%)	75(14.85%)	45(8.91%)	505(13.88%)	
	4	117(43.82%)	94(35.20%)	34(12.73%)	17(6.37%)	267(7.34%)	
	>4	315(62.88%)	79(15.77%)	71(14.17%)	26(5.19%)	501(13.78%)	
Shape	**Dry**	602(38.44%)	316(20.18%)	460(29.37%)	168(10.73%)	1566(43.05%)	
	Wet	817(39.87%)	967(47.19%)	135(6.59%)	108(5.27%)	2049(56.32%)	

of lesions	**Lupoid**	2(100%)	0	0	0	2(0.05%)	<0.001
	Sporo trichoid	1(50%)	0	1(50%)	0	2(0.05%)	
size of lesion (cm)	**1**	552(34.33%)	540(33.58%)	350(21.77%)	147(9.14%)	1608(44.20%)	<0.001
	2	376(37.08%)	425(41.91%)	131(12.92%)	73(7.20%)	1014 (27.87%)	
	3	187(41%)	166(36.40%)	67(14.70%)	33(7.24%)	456(12.53%)	
	>3	305(59.80%)	122(23.92%)	50(9.80%)	22(4.31%)	510(14.02%)	

41.88% of the patients were treated with intramuscular injection between 11 to 14 days and 2.58% of the patients were treated with this method less than 7 days. Similarly, 51.98% of the patients were treated with intralesional injection between 1 to 4 weeks. 72.46% of the patients were treated with combined cryotherapy and intralesional injection between 1 to 4 weeks in the same way (Table 4).

Table 4. Duration of the treatment in patients with cutaneous leishmaniosis

Treatment	Duration of treatment	Number (percent)
intramuscular Injection of Glucantime (Day)	<7	37(2.58%)
	7-10	441(30.73%)
	11-14	601(41.88%)
	15-18	160(11.15%)
	19-21	196(13.66%)
	Total	1435(39.44%)
Intralesional Injection of Glucantime (Week)	1-4	669(51.98%)
	5-8	354(27.50%)
	9-12	174(13.52%)
	Total	1287(35.34%)
Cryotherapy & Intralesional Injection of Glucantime (Week)	1-4	200(72.46%)
	5-8	36(13.04%)
	9-12	14(5.07%)
	Total	276(7.59%)

Based on the results of this study, 37 patients had a history of scars, which appeared on other areas of the body in 27 patients. In 20 patients, there was recurrence of the disease, of which 6 caseshad a record of systemic treatment and 14 cases had a record of topical treatment.

DISCUSSION:

The results of this study showed that men (60.80%) more than women (39.09%) are likely to be affected by this disease. In the study conducted by Nayebali Ahmadi in Kashan during the years 2005 to 2009, 45% of the affected people were female and 55% were male (13). In the study performed by in Palestine, the number of affected male was also greater than affected female (14). More than 64% of the affected people lived in urban areas. In the research conducted by Mansoor Nazari in Hamedan during the years 2004 to 2010, urban areas with 77.8% had also the highest number of affected cases (15). Moreover, in a study that Ali Kasiri conducted in Khorram-Shahr between the years 2008 to 2010, 65.75% of the patients lived in cities and 34.25% lived in rural areas (16). More than 31% (1157 people) were under the age of 10 years and 2.47% (90 people) were older than 61 years. In the studies conducted by Ahmadi in Kashan, Athari in Iran and Al-Jawabreh. in Palestine (2003), the most common cases were also those under the age of 10 years (13,14,17). During a five-year period study, 1566 people were infected with the rural type of leishmaniosis. In a study conducted by Nejati in Andimeshk, 38.1% of the affected people were infected with rural type of leishmaniosis (18).

According to the results of this study, the average lesion diameter (± SD) was 2 ± 1.12 cm. The lesion diameter in 1608 cases (44.20%) was

1 cm. In the study conducted by Shahmoradi in Isfahan, the average size of the lesion was 1.834 cm and in the study of Saatchi in Iran, 53.3% of the lesion diameters were 1 cm (19,20).

Moreover, in this study patients with total number of one lesion (42.06%) had the largest number of lesions. In the researchers conducted by Nejati in Andimeshk, Uzum in Turkey, Pontello Junior in Brazil (2013) and Maghsood in Pakdasht (2012) , 40.2%, 80.7%,70%, and 46.87% of the patients had only one lesion respectively (18,21-23).

The results of this study show that 1566 patients (43.05%) had a non-secreted lesion, 38.44% of which had been treated with intramuscular injection of glucantime, 20.18% with intralesional injection of glucantime, and 2049 patients (56.32%) had secreted lesion, 39.87% of which were treated with intramuscular injection of glucantime and 47.19% were treated with intralesional injection. In the study of Saatchi in Iran, of 67.53% patients with non-secreted lesion, 39.1% were treated with meglumine antimoniate intralesional injection, and of 31.48% patients with secreted lesion, 36.98% were treated with meglumine antimoniate intramuscular injection (20).

Based on the care guideline for cutaneous leishmaniosis in Iran, patients are treated systemically as glucantime intramuscular injection who have a lesion diameter of greater than 3 cm, lesions number of 5 or more, recurrence or treatment failure cases, sporotrichoid lesions, and lesion located on their joints or face, which according to the results of this study of 1435 patients treated with systemic meglumine antimoniate with the average number of (± SD) 2.64 ± 1.56 lesions, 315 patients had more than 4 lesions and 1117 had 4 lesions and less on their body parts. Furthermore, the lesion diameter with an average of (± SD) 2.20 ± 1.19 cm was greater than 3 cm in 305 patients. Based on national guideline, the recommended dose based on pure antimony for systemic treatment per day is 20 mg pentavalent antimony per each kilogram of body weight equal to 75 mg of glucantime per day, which is prescribed in rural leishmaniosis for two weeks and in urban leishmaniosis for 3 weeks. The duration of the treatment for 601 people was between 11 to 14 days. 591 patients (41.18%) were fully recovered without any complications, and 725 patients (50.52%) were reported to be recovering. In the study conducted by familial in Mashhad, with an average number of 3.9 ± 1.38 lesions, there was complete recovery in 37.9% of the patients and partial recovery in 34.6% of the patients after 6 weeks of treatment (24). In the study performed by Sadeghian and Nilooforoshzadeh in Isfahan (2006), of 31 patients treated with systemic glucantime with an average number of 4 ± 5 lesions, there was complete recovery in 16 patients and relative improvement in 9 patients at the end of 3 months (25). In the study of Layegh in Mashhad, with an average number of 2.15 ± 1.38 lesions, of 27 patients treated with systemic glucantime, there was complete recovery in 34.5% of lesions and relative improvement in 13.8% of lesions (26).

This study shows that of 1287 patients treated topically with the average number of (±SD) 2 ± 1.23 lesions, 1204 patients had 4 lesions or less and 79 patients had 5 lesions and more, and the lesion diameter with the average of (±SD) 1.98 ± 1.08 cm in 122 patients was greater than 3 cm. Since based on national guideline for those people with 5 lesions or more and the lesion diameter greater than 3 cm topical treatment could not be used, intralesional injection has been used for these people and the country's guideline has not been observed in this case. Based on national guideline, topical treatment is given once a week and it is prescribed until complete recovery of the lesion or up to a maximum period of 12 weeks. The duration of the treatment for 669 patients (51.98%) was between 1 to 4 weeks. Complete recovery without any complications was achieved for 450 patients (34.96%) and for 765 patients (59.44%) they were reported to be recovering. In the study of Shahmoradi in Isfahan, 30 patients treated with glucantime intralesional injection with the average initial size of lesion equal to 1.863 cm, 28 patients were recovered (19). In the study performedby Saghafipoor in Qom, with the average number of 2.14 ± 0.85 lesions and average lesion diameter of 2.38 ± 2.85 cm,

91% of lesions treated with glucantime intralesional injection were fully recovered clinically after the end of 12 weeks (27). In another study performed by Asilian in Isfahan, of 31 patients treated with topical glucantime, complete recovery in 50% of the patients and partial recovery in 43.7% of the patients was reported one month after the end of treatment (28).

Although the methods described here are relatively effective, but safer methods should be searched. Infectious diseases are induced by microorganisms which act and get resistant to drugs by different approaches (31-41). Medicinal plants due to having a complex of active components may be effective against them. Medicinal plants have been shown to be relatively safe and effective on various diseases (41-51). Hence, they might be good source for this purpose.

This study indicates that 16.43% (598 People) of the patients were treated with cryotherapy, which resulted in complete recovery without any complications in 192 patients (32.10%) and 401 patients (67.06%) were reported to be recovering. In Gurei's study also 78% of the lesions represented significant or complete improvement at the end of three months treatment (29). In addition, In the study conducted by Asilian in Isfahan, of 185 patients treated with cryotherapy with a number of 210 lesions, 57.3% of lesions were fully recovered after 1 to 3 treatment sessions (30).

In this study, 7.59% (276 people) of the patients were treated with combined cryotherapy and intralesional injection, which resulted in complete recovery without any complications in 113 patients (40.94%) and 156 patients (56.52%) were reported to be recovering. In the study of Saghafipoor in Qom, 100% of lesions treated with combined method were fully recovered clinically (27). In another study performed by Asilian in Isfahan, of 150 patients treated with combined cryotherapy and intralesional injection with a lesion number of 132, 90% of lesions were fully recovered after 1 to 3 sessions (30).

Based on the results of this study, 37 patients had a record of scar, which had appeared in other body areas in 27 patients. There was recurrence in 20 patients, of which 6 patients had a record of systemic treatment and 14 patients had a record of topical treatment. They were treated based on national guideline and were recovered. In studies conducted by Uzun in Turkey, 3.9% of the patients treated with topical treatment experienced recurrence (21). Also in a study in Brazil, 32 patients experienced recurrence, of which 26 cases happened within the first 6 months after recovery (51).

If there is no sign of recovery in the lesion after 4 weeks of systemic or topical treatment, it is considered as treatment failure. Systemic treatment is applied if the size of the lesion becomes smaller, or the number of lesions is reduced, or there is no significant changes in the lesion. The patient is referred to a dermatologist if there is no reaction to the second period of systemic treatment (clinical resistance). During this period, there was a treatment failure in 12 patients treated with glucantime intramuscular injection, of which 5 patients received systemic and 7 patients received topical treatment based on national guideline and were recovered. Treatment failure was reported for 6 patients treated with glucantime intralesional injection who were recovered after treating with glucantime intramuscular injection and there was no failure in other treatment methods. Clinical resistance was reported in 1 patient treated with intramuscular injection and 3 patients treated with glucantime intralesional injection. In the study performed by Saatchi in Iran, treatment failure was reported in 4 patients, of which 3 patients had received systemic meglumine antimoniate and 1 patient received meglumine antimoniate intralesional injection treatment (20). In the study familial in Mashhad, no improvement was reported in 21.5% of the patients after 6 weeks of systemic glucantime treatment (24). In another study performed by Asilian in Isfahan, of 32 patients who received topical glucantime treatment, no improvement was reported in 6.3% of the patients after one month of treatment (28). Also in the study of Saghafipoor in Qom, no improvement was observed in 11 lesions (9%) treated with meglumine antimoniate intralesional after 12

weeks (27). In another investigation by nilooforoshzadeh in Isfahan, of 370 patients who received systemic glucantime treatment, 8.1% did not respond to antimony compounds after 12 weeks (52).

In this study, 35 patients (0.97%) had complications of treatment, of which 24 patients received intramuscular treatment, 10 patients received intralesional injection, and 1 patient received cryotherapy and intralesional injection. In the study of Saatchi in Iran, 17 patients (0.4%) had complications of treating lesihmaniosis, of which 5 patients had received intramuscular treatment, 7 patients had received intralesional injection, 1 patient treated with cryotherapy, and 4 patients treated with combined cryotherapy and intralesional injection (20). In the study conducted by Uzun in Turkey, complications were reported in 5% of the patients (21). Also in the study Nilooforoshzadeh in Isfahan, of 43 patients treated with glucantime intramuscular injection, only two patients experienced complications (53). In Salmanpoor and Bahmani's study in Shiraz, of 30 patients treated with glucantime intralesional injection, complications were observed in two patients (54).

CONCLUSION:

Finally, according to the present study and based on the care guideline for cutaneous leishmaniosis in Iran, patients with more leishmaniosis, larger size of lesion diameter, and non-secreted lesion were treated systemically. Treating leishmaniosis disease should be included on officials', researches' and physicians' agenda based on the clinical course of the disease, availability of medicines for leishmaniosis, efficacy, effectiveness, and awareness and notification in those regions where the disease is endemic for prevention, control and reduce of the disease.

ACKNOWLEDGEMENTS:

This paper is a part of a dissertation conducted with the title of "Epidemiological study of cutaneous leishmaniosis using Geographic Information System (GIS) in the south of Ilam province during the years 2010-2015" and the code received from Committee on Medical Ethics (ir.medilam.rec.1395.82) approved by Medical University of Ilam and supported by this university. I would like to express my special thanks to Dr. Mahmood Bahmani as well as Ali Jalilian for their efforts.

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