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Research Article

The process of effectiveness and the treatment of cutaneous leishmaniasis in Dehloran city, Iran during 2014

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ABSTRACT

Leishmaniasis is a common parasitic disease among humans and animals mainly created by species of *Leishmania major*, *Leishmania infantum* or *Leishmania tropica*. Antimony compounds have been introduced and used as first-line agents for the treatment of leishmaniasis. Given the prevalence and spread of leishmaniasis and necessity of medical treatment and follow-up treatment, this study was aimed to present the procedures of treatment of cutaneous leishmaniasis in the city of Dehloran, in Ilam Province, Iran. This study was conducted in April to March 2014 on 676 patients who had active lesions suspected to leishmaniasis referred to the cutaneous leishmaniasis treatment center in Dehloran city. Wound samples were prepared and Giemsa stained. The wound was diagnosed when the Leishmania parasites were seen in tissue specimens. The patients' treatments were various including intralesional meglumine, systemic, cryotherapy and hybrid treatment methods depending on the frequency, intensity, location, extent, type, number, size and location of the lesions. 38.1% of patients were treated with systemic antimony, 38.3% with topical antimony, 15% of patients with cryotherapy alone, 8.1% with topical antimony with cryotherapy and 1% of patients with other therapies. All patients were successfully treated with different methods. Other important items in the choice of treatment were the number of lesions and lesion location. Given that the subjects had leishmaniasis wounds in sensitive and non-sensitive areas of the body they were exposed to different treatment regimes. The patient compliance with physician until the end of treatment process was another factor affecting the success of treatment in this study.

Keywords: Leishmaniasis, Meglumine, Cryotherapy, Dehloran

INTRODUCTION

Leishmaniasis is a common parasite disease among humans and animals mainly created by various species of Leishmania parasite [1]. Leishmaniasis is a protozoan pathogen, called Leishmania. This protozoan is in kinetoplast (kDNA) owners which can be seen in terms of its

living environment in two ways amastigote or Leishman body and also Promastigote. This parasite of vertebrates lives in the mononuclear phagocytic cells and has proliferation. Leishmaniasis is generally transmitted by the sand fly species [2]. According to the World Health Organization in 98 countries leishmaniasis is endemic and more than 350 million people are at risk, the number of incidence of Leishmania has been estimated about 12 million. Two million new cases of leishmaniasis occur each year that, about 0.5 million cases are with kala-azar and 1.5 million patients are with Cutaneous Leishmaniasis [3]. Leishmaniasis is observed in tropical America, Africa and Indian subcontinent and sub-tropical areas of Southeast Asia and the Mediterranean region of Kay's Andaman. Although leishmaniasis is usually not associated with a high mortality but the high incidence and deformed skin lesions in some cases remaining more than one year in some cases and its scar existing after its recovery for life, even with the standard treatment, causes harassment for the patient [4-6].

Leishmaniasis is endemic in nearly half of the provinces of Iran. Mashhad, Shiraz, Tehran, Kerman, Neyshabur, Yazd, Bam, Isfahan, Fars, Khuzestan, Kerman, Golestan, Khorasan Razavi, North Khorasan, Bushehr, Hormozgan, Semnan, Sistan and Baluchestan, Yazd, Ilam etc. are the main locations of infection with leishmaniasis [7]. The agent of cutaneous leishmaniasis in Iran is mainly *Leishmania major*, *L. infantum* and *Leishmania tropica*. Leishmaniasis eventually yields a scar. Sometimes even without treatment it is improved on its own. Antimony compounds have been introduced and used as the first-line agents for the treatment of leishmaniasis [8, 9]. Given the prevalence and spread of leishmaniasis and the need for treatment and follow-up of treatment process [10, 11], the aim of this study was to present the procedures of treatment of cutaneous leishmaniasis in the city of Dehloran, in Ilam.

Methodology

Subjects

In this study was done during April to March 2014 on 683 patients who had active lesions suspected to leishmaniasis, referred to the cutaneous leishmaniasis treatment center of Dehloran city, from them, 676 peatients were included after filling the forms and providing consent for treatment follow-up.

Sampling from suspected subjects

Suspected cases with completed patient-finding forms were sent to the leishmaniasis laboratory of city. In the lab, specimens were taken from different parts of the cutaneous lesions. Some samples were taken from various wounds from patients who had multiple lesions. From multiple and large wounds (≥3cm) three smears were prepared from each sample. The inflamed and swollen sides of skin lesions are the most important parts with the highest density of amastigote. The important point is that with more samples taken from the tissue, it is more likely to have parasite in the sample. Since skin lesions might have secondary bacterial or fungal infections, it was necessary to clean the location of the lesion where we wanted to take sample. In most cases we changed the alcohol cotton several times [12].

Staining samples with Giemsa

First smear was prepared from samples and the samples were allowed to be dried without the use of flame at room temperature. Then it was poured on the 70 ° C methanol slide for 30 to 60 seconds. Giemsa stain with a PH of 7.2 for 30 to 50 minutes was added to the dried slides. Then slides shortly in water with PH around 7.2 were rinsed and the slides were dried. Finally, slides were observed with the lens 10.40 and 100 [12].

Treatment type

Intralesional meglumine treatment:

The location of the lesion was disinfected with iodine or alcohol cotton. With a fine needle No. 27 or 30 with an angle of 45 degrees as the tip of the needle was toward the center of the lesion, at the border of healthy skin and induration

beginning it was injected into the lesion sideline. 0.1 ml of the drug was injected in the dermis so that the lesion margin became white and this operation was repeated at intervals of 1 cm in total lesion margins in whole environment of the lesion. In large lesions if the center of the lesion was not injured, 0.1 to 0.2 ml of drug was injected in the center of the lesion [12].

Cryotherapy method:

For cryotherapy, a sufficient amount of liquid nitrogen was poured in disposable cups. Cotton swab was kept for several seconds in liquid nitrogen to be completely impregnated with nitrogen, then it was quickly placed on the lesion and for 10 seconds was pressed on lesion, so that the lesion became white. This action was repeated on total surface of lesions until the lesion became white and up to 2 mm margin of healthy skin around the lesion. This method is superior to Cryospray [12].

Systemic therapy:

If the lesion was in the face, or the number of lesions was greater than 5, or more than 3 cm in diameter, Aspvrvtr Qiu, the joint damage and also in recurrence or treatment failure, systemic therapy was used [12]. Systemic therapy was carried out with intramuscular injection of meglumine. The recommended amount was administered based on the daily net antimony for the systemic treatment of 20 mg pentavalent antimony per kg body weight, equivalent to 75 mg of meglumine on a daily basis in rural leishmaniasis. Systemic therapy was applied for 2 weeks and systemic therapy was prescribed for 3 weeks in urban leishmaniasis. If after 4 weeks after completion of systemic or topical therapy no signs of recovery were observed in the lesion, systemic therapy was again administered with the previous dose as treatment failure. If there was no response to the second systemic therapy (clinical resistance) the patient was referred to a dermatologist. Observing the lesion dressing has always been necessary until complete remission [12].

Other treatments: Other treatments, if necessary, were combination of the above methods [12].

RESULTS

According to the type, number, size and location of the lesion, 38.1% of patients were treated with the antimony, 38.3% with topical antimony, 15% with cryotherapy patients, 8.1% with topical antimony and 1% with other cutaneous leishmaniasis treatment methods. Further results of treatment type, number of treatments in each group and the treatment percentage of each group are shown in Table 1.

Type of treatment	Number of treatment in each group.	The percentage of treatment in each group
Systemic antimoan	258	%38.1
Local antimoan	259	%38.3
local antimoan associated with cryotherapy	55	%8.1
Other treatment	7	%1
Cryotherapy alone	102	%15
Blank	2	%0.2

Table 1. Type of treatment, number of treatments in each group and the treatment percentage of each group

DISCUSSION

Antimony compounds are used for many years as the standard cutaneous leishmaniasis treatment and the first-line drugs for the treatment. Theses drugs need repeated injections therefore, toleration f treatment by patients is low and this may be the cause of low effectiveness of this drug [13]. The effectiveness of meglumine antimonate (glucantime) is low and in addition, recently the drug resistance in Leishmania tropica has been reported in Iran [14]. In this study, patients whose clinical suspected lesions of leishmaniasis were confirmed by direct examination or culture were screened and after completing consent forms were enrolled. The main outcome included complete treatment as complete rapid liazition and loss of hardness exemplary wounds. In the present study, 38.1% of patients were treated with systemic antimony, 38.3% with topical antimony, 15% with

cryotherapy, 8.1% with topical antimony, and 1 percent used other therapies for the treatment of cutaneous leishmaniasis and the outcome was excellent.

In a study conducted in India it was found that in a group of Leishmania patients with tropica cutaneous leishmaniasis species that had Pentostam injection once a week, there was no significant difference with patients with intralesional Pentostam injection twice weekly [15]. In a study that was conducted in Pakistan it was shown that the effectiveness of weekly intralesional injection of glucantime was significantly higher than injecting twice a week, but in this study the specie of parasite was not determined [16]. In our study, the vast majority of cases of cutaneous leishmaniasis species *were Leishmania major*. Probably one of the factors affecting the success of one hundred percent in our study was the incidence of cutaneous leishmaniasis by *Leishmania major*. Intralesional injection of glucantime had satisfactory results in endemic areas such as Saudi Arabia [15]. In a study conducted in Mashhad (Iran) the effectiveness of intramuscular injection of glucantime based on complete rapid liazation in 8^{th} week after treatment was 3.3 percent, in the twentieth week after treatment was 40% and disappearance of the 75 percent of stiffness of the lesions in the eighth week after treatment was 48.3% and in the twentieth week after treatment was 53.3% [17]. Probably the lack of response to treatment in some studies may be due to incomplete treatment. Generally toleration of daily injection of 10 to 15 mL of intramuscular glucantime is very difficult, so usually patients prefer intralesional injection. In our study, the compliance of the patient in leishmaniasis treatment center was very good and treatment period was completed that, it was also of success factors in our study [13]. The decision to select appropriate treatment should be selected based on the ratio of benefits to risks of drug use, health status, availability of anti-*Leishmania* and considering the people's health for example in the prevention of antibiotic resistance. The best method of treatment was using combination therapy to prevent the development of drug resistance. Other important items in the choice of treatment were the number of lesions and lesion location. Given that the subjects had sensitive and non-sensitive active leishmaniasis sores all over their bodies were treated with different regimes. Cooperation between the physician and patient until the end of the process of treatment is of other factors that affect the success of treatment in the study.

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