

Case report

Acute allergic reaction following cutaneous leishmaniasis (CL) transmission in Kashan, central Iran: a case report

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ABSTRACT. Cutaneous leishmaniasis (CL) transmitted by the bite of infected female phlebotomine sand flies endemic in many parts of rural and urban areas of Kashan, central Iran. Rare systemic allergic reactions, including anaphylaxis can occur in response to the bites of mosquitoes. In 2019, the patient was a 20-yr-old woman referring to the Health Care Centre in Kashan, central Iran, and complaint of symptoms allergic. After receiving anti-allergic drug therapy a month, skin lesions appeared on her forehead, forearm, and right arm. The disease was diagnosed with positive CL by direct smear. Her lesion treated with systemic meglumine antimonate (Glucantime®) (1.5 g/5ml/week) for seven-week. In conclusion, CL, as a public health problem, especially for travellers and patients with allergies to insect bites, is the most common in endemic areas. It guides us to consider the control programs of this disease, and much attention should be given to improve the environmental conditions for vector-borne control and public health education for personal protection.

Keywords: leishmaniasis, cutaneous, acute allergic, Kashan

Introduction

Leishmaniasis is a disease caused by protozoan parasites of the genus *Leishmania* and transmitted by the bite of infected female phlebotomine sand flies (Family: Psychodidae; Subfamily: Phlebotominae) [1]. World Health Organization (WHO) reported 98 countries with more than 350 million people at risk of as endemic leishmaniasis. It estimates that there are 12 million cases of CL worldwide, and there are 1.5 million new cases per year [2]. In the old and new world, most cases of CL occur in Afghanistan, Algeria, Islamic Republic of Iran, Saudi Arabia and the Syrian Arab Republic, in Bolivia and Brazil, Colombia, Nicaragua, and Peru [3]. Based on studies, community knowledge about CL is low [4]. One of the most important strategies for controlling CL is educational, preventive measures, such as

raising people's knowledge of protective skills for personal protection in endemic areas [5]. Routine diagnosis of CL is using the examination of skin biopsies [2]. Recently, the number of reported cases of CL was particularly high in the Islamic Republic of Iran [6]. It should be noted that at present, CL is the most important vector-borne disease in many parts of Iran, such as Isfahan Province [7,8]. Kashan is one of the largest cities in Isfahan Province, where annually cases of CL are reported [9,10].

Anaphylaxis is a severe allergic response that is rapid in onset and can cause death, as defined by an international multidisciplinary group of experts [11]. The most common stimuli include food, medications, and insect stings [11,12]. Generally, diagnosis is based on defined clinical criteria as asthma and other respiratory, cardiovascular disease, gastrointestinal symptoms, and clonal mast

cell disorder, and the increase in the rate of IgE is less commonly implicated [11]. Mostly, emergency preparation for the recurrence of anaphylaxis includes having epinephrine (adrenaline) auto-injectors available [13]. The incidence rate of anaphylaxis is progressing, especially during the first two decades of life, and it is the highest in young people and females [11].

We report here a case of acute allergic reaction following cutaneous leishmaniosis (CL) transmission after traveling to Kashan, Central Iran.

Case presentation

In late July 2018, a 20-year-old woman travelled to Kashan, a complaint of symptoms of rash on the chest and waist, shortness of breath, diarrhoea, fatigue, extreme lethargy, abdominal and chest pain, referred to a Health Centre Kashan (Fig.1). She received epinephrine injection therapy.

After a month, non-scratching and painless skin lesions appeared on her forehead, forearm, and right arm. Simultaneous, purulent pustules observed on



Figure 1. Lesion of due to anaphylaxis rash on patient's forehead

the waist and chest (Fig. 2). The patient referred to a gynaecologist and did many laboratory tests as ultrasound scanning of the pelvis to detect polycystic ovary. The ultrasound scanning showed the uterus and ovaries normal in size and shape, and no masses or cysts observed. The results of laboratory tests were normal, included: FBS (78 mg/dl), TG (112 mg/dl), Cho (134 mg/dl), AST (13 U/l), ALT (11 U/l), ANA (negative), CRP (negative), Wright (negative), Widal (negative), ESR (14 per/hour), 1-25-dihydroxyvitamin D (32.45 ng/ml), TSH (4.56 mIU/ml), T3 Triiodothyronine (1.64 ng/ml), Thyroxin Total T-4



Figure 2. Lesions of purulent pustules on the patient's skin

(6.08 ng/ml), whereas the titer of IgE was >200 IU/ml and cell blood count (CBC) showed peripheral blood eosinophil (5%).

Then, after a few days with the appearance of large scars on the forehead, forearm, and right arm (Fig. 3), the dermatologist requested skin biopsy samples agent of leishmaniosis. CL confirmed by observation of the Leishman bodies (amastigotes) by direct smears of ulcers.

Her lesion treated with solution injectable meglumine antimonate (Glucantime®) (1.5 g/5ml/week) for seven weeks. Pustules treated with



Figure 3. A 20-yr-old woman with lesion of cutaneous leishmaniosis (CL) on forehead

Ketoconazole shampoo, doxycycline hyclate tablets, and Alcoholic solution. About two months later, during the following up, the rate of IgE and peripheral blood eosinophil were normal. The patient's CL lesion and purulent pustules resolved.

Conclusions

This report describes an unusual case of acute allergic reaction following cutaneous leishmaniasis. The patient travelled a rural area in Kashan (Isfahan Province, located in the centre of Iran). In recent years, the incidence of CL showed a significant decrease; but, CL is still a public health problem in this county [14]. CL transmitted by the bite of infected female sand flies with *Leishmania* parasites [1]. The saliva of blood-feeding insects includes several substances, such as anticoagulants, enzymes, and active small molecules [15]. One of the causes of a severe allergic reaction (anaphylaxis) is insect stings [11,12]. In the case reported in the present study, the patient had acute allergic reaction following sand fly bite. Generally, allergic reactions to biting insects mediated by IgE antibodies are considered uncommon [15]. Nevertheless, in our case, the IgE antibodies increased with peripheral blood eosinophil and skin rash (improved with proper treatment).

CL usually happens in an uncovered part of bodies such as hands, feet, and face, because the mouthparts sand flies are very short; they are unable to bite through clothing [16]. In Kashan, 37.3% patients had two or more lesions, and 61.4% of CL lesions were placed on hands and 16.4% on the face [14], that it was consistent with our case, having two of her three lesions CL on her arm and forearm and one on the face. The case reported was 20 years old, and based on the study in Kashan, CL was reported that the highest incidence of CL occurred in the 20-29-year-old age group [14]. Regarding the seasonal tendency of CL, in our case, we found out it occurred in early autumn that it is consistent with finding in Kashan, Qom, Yazd, and Fars Province studies [8,14,16–18].

Although CL is a self-limiting disease [10], the first-line drugs of treatment for all forms of leishmaniasis are the pentavalent antimonial compounds [10,11]. In this regard, 81.6% of patients in Kashan improved by treatment regimen systemic meglumine antimoniate (Glucantime®) [14], which was similar to our patient's treatment. Presently, there is no efficient vaccine to prevent the CL, and treatment does with antimony compounds that have some limitations, such as toxicity resistance and long duration of treatment [19]. In conclusion, people living or traveling to endemic areas are recommended using personal protection like long-sleeved, sleeping under the mosquito net,

and using an insect repellent. Also, the early diagnosis and treatment of diseases can prevent the spread of the CL, especially in endemic area.

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