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The prevalence of cutaneous leishmaniasis in Al-Ahssa, Saudi Arabia

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Abstract
Background: Cutaneous leishmaniasis (CL) is an endemic disease transmitted by bite of infective female sand fly. CL is caused by *Leishmania major* and *L. tropica*. *L. tropica* is restricted to human beings.
Objective: This work aimed to study the prevalence of CL in Al-Ahssa, Saudi Arabia.
Patients & methods: A retrospective study of cases infected with CL from 2009 to 2010 from Saudi vector central unit databases.
Results: In the study period, there were 444 patients in 2009 and 457 patients in 2010 infected with CL. The ratio of Saudi male to female was 2:1, whereas infected non-Saudi male to female was 33:1. Age of male patient was higher than in female patient in both Saudi and non-Saudi cases. Urbans are the most affected, while Bedouins are the least affected. The lesions are mostly single and the face is the most affected site in patients who are below 15 years, while those above 45 years are mostly affected by lower limb lesions.
Conclusions: CL is an endemic disease in Saudi Arabia especially the eastern region. The presence of rodents and sandflies makes it a suitable environment for Leishmania to spread. Therefore, public health and vector measures are required to decrease the prevalence of CL in Al-Ahssa.

Keywords: cutaneous leishmaniasis; sand fly; endemic diseases; Saudi Arabia; *Leishmania major*

Introduction
Leishmaniasis is a disease caused by the *Leishmania* protozoan parasite and transmitted by the bite of an infective female sand fly [1]. It is a spectral disease that includes localized skin lesions which is called cutaneous leishmaniasis (CL), and progressive visceral leishmaniasis which affects the internal organs and requires a Type 1 immune response to undergo cure [2].
CL is endemic in the tropics and neotropics [3]. It usually occurs in the Old World and is caused by *Leishmania* (*L.*) *major* and *L. tropica* [4]. *L. tropica* is restricted strictly to human beings and the lesions due to this species may persist for longer time (6-15months) [5]. There are 1.8 million new cases annually [6]. CL may be limited to a single part of the skin which is called localized cutaneous leishmaniasis or may produce a large number of lesions which is called diffuse cutaneous leishmaniasis [5]. Skin lesions are categorized into 3 types, often in sequence: (i) hypopigmented macules markedly similar to the lesions of lepromatous leprosy, (ii) erythematous macules develop, which develop next, and (iii) yellowish pink nodules that finally appear, mostly on the face [7].
The geographic distribution of CL is mainly determined by the sand fly vectors. They live in dark, damp places. They become infected through feeding on infected animals or humans. Once a sand fly is infected, it can transmit the parasite to humans for the rest of its life [8]. The people in endemic areas may have a good awareness regarding the clinical features of CL, but the awareness regarding the vector, transmission, risk factors and preventive methods were very poor [9]. There are different types of treatment of CL including: medications like pentavalent antimony, cryotherapy, heat and surgical excision [10]. This study was conducted to find out the prevalence of CL in Al-Ahssa and its relation with demographic data of the population.

Materials and methods
Study design
Retrospective study was conducted in vector central unit, Al-Ahssa, Saudi Arabia.

Study population
The study population consisted of patients with CL in KSA in the period from 2009 to 2010. Demographic data includes age, sex, residence, and inhabitable of the patient. Clinical data is on the basis of presence or absence of CL lesions or scars and number of lesions.

Statistical analysis
The data were presented mean ± standard deviation (SD) for continuous variables and percentage for categorical variables using Statistical Package for the Social Sciences (SPSS) (SPSS Inc., Chicago, Illinois, USA), software for windows, version 14.0.

Result
The total number of patient in 2009 was 444 patients. It's increase in 2010 to 457patients. Percentage of male, who are affect, is more than female as shown in figure 1&2. The number of non-Saudi males was more than Saudi males and number of Saudi females was more than non-Saudi female.

Ratio of Saudi male to female was 2:1 and ratio of non-Saudi male to female was 33:1 in 2009 and 2010 (Figure 1 & 2).

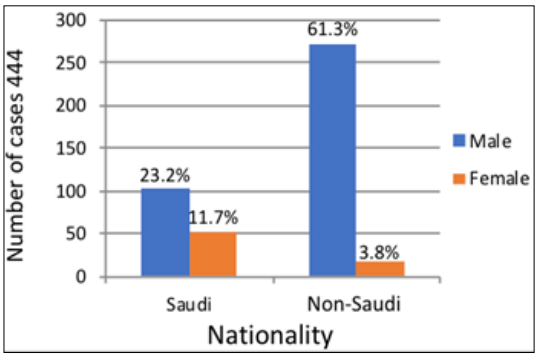

Fig 1: Percentage of Saudi and non-Saudi cases of CL in relation to gender in 2009

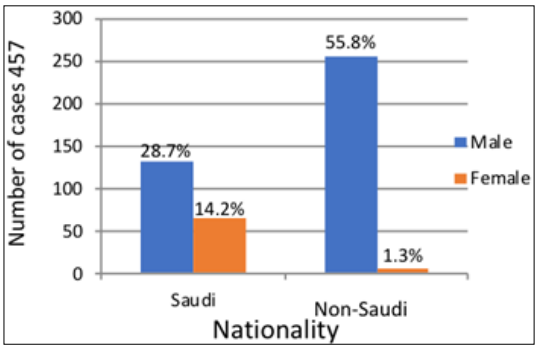

Fig 2: Percentage of Saudi and non-Saudi cases of CL in relation to gender in 2010

Age of male patient was higher than in female patient in both Saudi and non-Saudi cases (Table 1).

Table 1: Distribution of CL cases in relation to age, nationality, and gender in 2009-2010

Years	Saudi (Mean± SD)		Non-Saudi (Mean± SD)	
	Male	Female	Male	Female
2009	25.9±5.4	18.6±1.8	31.6±6.2	24.8±5
2010	23.5±3.7	15.3±2	31.8±7.3	30.3±4.8

Urban is the most affected, while Bedouin was least affected in both 2009 and 2010 (Figure 3).

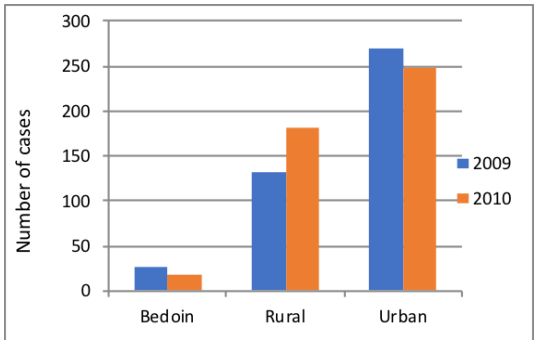

Fig 3: Distribution of cases of CL in relation to residence in 2009 and 2010

Regarding the lesions, the face was mostly affected in patients, who are below 15 years, more than other, while those above 45 years, were most affected with lower limb lesions as shown in figure 4.

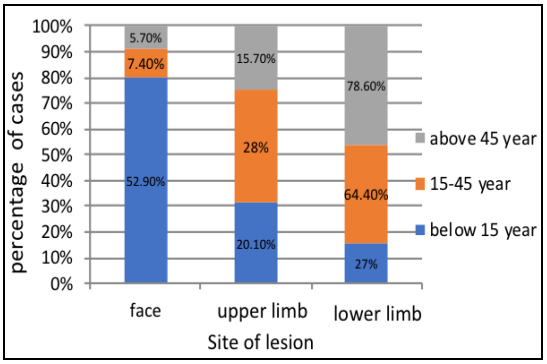

Fig 4: Distribution of percentage of CL lesions per patients in different age group

Discussion

CL is endemic in Saudi Arabia in the Eastern region especially in Al-Ahssa, its weather very hot in the summer and cool in winter. The vector of the disease is the sand fly (*Phlebotomous papatasi*) and the natural hosts are desert rodents. *L. tropica*, the causative agent of CL in the Al-Ahssa, classically causes skin lesions [11].

According to this study, CL affects males more than females which can be explained by the habit that female in Saudi Arabia cover all their bodies [11]. This result agrees with the study of Yaghoobi-Ershadi *et al.* [12], which was conducted in Iran. They found significant difference between males and females. The proportion of males and females were 51.2% and 48%, respectively [12]. In contrary to the current study, Al-Tawfiq *et al.* [11] stated that both males and females were affected equally. Non-Saudi people affected more than Saudi people. This finding is similar to study of Al-Qurashi *et al.* [13]. This could reflect differences in previous exposure and immune status of Saudi and non-Saudi population [13].

The current study reported that CL affects patient with mean age ranging from 23.5 – 25.9 years of Saudi male patients and ranging from 31.6 – 31.9 years in non-Saudi, while that of females was ranging from 15.3 – 18.6 years in Saudi and 24.8 – 30.3 years in non-Saudi. The mean age of male patient was higher than in female. The result agreed with those of Al-cindan *et al.* [14] who stated that the Saudi patients were considerably younger and had significantly milder disease compared with the non-Saudi patients. Al-Tawfiq *et al.* [11] mentioned that the majority (76%) of cases occurred in individuals <15 years of age with mean age 10.9 years and the lowest rate of patients were between the age of 60 and 69 years.

According to this study, CL affects urban more than other regions which can be explained by the adaption of sand fly to urban environments [15]. There are few studies which had attempted to highlight the socioeconomic-cultural correlates, especially with regard to rural versus urban populations [16]. Evidences confirmed the emergence of cutaneous leishmaniasis in the northeastern region of Brazil and it is now endemic for CL in urban zones [17].

The current study clearly confirmed that CL lesions differ

according to the anatomical distribution of skin lesions and age group [11, 18]. These results showed that the most affected sites were the face in children, lower limb in adult, and old age. The result also showed that all age groups were susceptible to infection with leishmaniasis. It is interesting to note that < 15 years are affected less frequently than other age group in our population. In contrast, skin lesions of CL were located almost equally on the upper limbs, lower extremities and the face as reported by Al-Tawfiq [11]. Previous descriptions of disease indicated that extremities were more often involved in CL than the face [18, 19]. This finding may be explained by the fact that sand flies usually travel close to the ground where they can easily bite the lower extremities. In addition, sleeping outdoors and the exposure of extremities may encourage sand flies to bite during the night [18]. Outdoor activities between dusk and dawn increase the transmission of CL [13].

Conclusions

CL is endemic disease in Saudi Arabia especially the Eastern region. The presence of rodents and sand flies makes it a suitable environment for leishmaniasis to spread in an endemic epidemiological pattern. Being engaged in farming activities or occupations that requires staying outdoors for long periods and till night times increases the risk of encountering CL infection. The CL affects both sex and non-Saudi and Saudi. The number of non-Saudi was more than Saudi; also number of males was more than females. All age groups were susceptible to infection with CL. Therefore, public health and vector control measures are required to decrease the prevalence of CL in Al Ahssa.

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