Original Article

Incidence Trend of Cutaneous Leishmaniasis (CL) in Majmaah, Kingdom of Saudi Arabia

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Received on: 12th September 2017 Accepted on: 17th October 2017

Abstract

Background: Leishmaniasis is caused by the flagellate protozoa of the genus Leishmania and is transmitted by the bite of female phelobotomine sand flies. Worldwide, an estimated 1.5 million cases of cutaneous Leishmaniasis occur annually. Although the disease showed remarkable decline in the prevalence during 1987 and 1990 in Riyadh region of Saudi Arabia, few studies had addressed the current status of the disease in recent times. The objective of this study was to determine the trends in reported incidence of Cutaneous Leishmaniasis in Majmaah, Saudi Arabia between 2007 and 2016.**Research methods:** The research design was descriptive, institutional-based study of the epidemiological trend of Cutaneous Leishmaniasis infection in Majmaah, Saudi Arabia using data from the surveillance data base at the regional Vector Control Unit, Local Health Directorate; Riyadh, Saudi Arabia. Total enumerations of all records of patients registered and treated in King Khalid hospital, Majmaah during 2007-2016 were included in this study. The data last five years of the study.

الملخص

خلفية: يتسبب داء الليشمانيا من الحيوانات أحادية الخلايا منجنس الليشمانيا وينتقل عن طريق لدغة ذبابة الرمل من إناث القلب وتامين. يحدث سنويا ما يقدربحوالي ١,٥ ملي ونحالة من داء الليشمانيا الجلدي حول العالم. على الرغم من أن المرض أظهرانخفاضا ملحوظا في الانتشاربين عامي ١٩٨٧ و ١٩٩٠ في منطقة الرياض بالمملكة العربية السعودية الا أن هنالك دراسات قليلة تناولت المرض في الآونة الأخيرة. الهدف من هذه الدراسة هو تحديد الاتجاهات في حالات الليشمانيا الجلدي التي سجلت في المجمعة بالمملكة العربية السعودية في الفترة مابين عامي ٢٠٠٧ و ٢٠١٦.

منهج البحث: هذه الدراسة وصفية لتحديد الاتجاه الوبائي لعدوى الليشمانيا الجلدية في المجمعة بالمملكة العربية السعودية باستخدام قاعدة بيانات الرصد المرضي بوحدة مكافحة نواقل الأمراض بمديرية الصحة ، الرياض بالمملكة العربية السعودية . تمجمع البيانات عن طريق قائمة المراجعة من سجلات المرضى الذين تم علاجهم بمستشفى الملك خالد بالمجمعة ,المملكة العربية السعودية خلال ٢٠٠٧-٢٠١٦. تم تحليل البيانات عن طريق برنامج الحزمة الاحصائية (SPSS- 22) للعلوم الاجتماعية.

النتائج: تعتبرالفئة العمرية ١٥- ٤٤سنة أكثرالفئات اصابة

were collected by a pre-tested check list and analyzed by SPSS version 22. **Results:** The age group 15-44 was mostly affected by Cutaneous Leishmaniasis (50.6%). Most patients were males (78.2%) and majority of the Saudi nationality (62.1%); farmers were mostly affected by the disease (28.7%) compared to other occupations. The reported incidence of the disease was 33:100000 populations in 2007 and reached its peak as 44:100000 populations in 2008 then started to decline with fluctuations to reach 4:100000 populations in 2016. During the first five years of the study (2007-2011), patients less than 15 years of age were 21(30.9%) while those 15 years of age and more were 47 (69.1%); the male and female patients were 82.4% and 17.6% respectively. During the second half of the study (2012-2016), patients less than 15 years of age were 4(21.1%) while those 15 years of age and more were 47 (69.1%); the male and female patients were 82.4% and 17.6% respectively. **Conclusion:** The findings of this study concluded that the trends of Cutaneous Leishmaniasis in Majmaah, Saudi Arabia declined during the past ten years. The disease was more prevalent among the older age group, the Saudis, and the male gender: However, the incidence of the disease among the females increased significantly during the

بلليشمانيا الجلدية (٥٠,٦٪) . معظم المرضى من الذكور (٧٨,٢٪) والجنسية السعودية (٦٢,١٪) .المزارعون اكثر اصابة بالمرض مقارنة بالوظائف الأخرى. نسبة حدوث اليشمانيا الجلدية المبلغ عنها ٣٣: ١٠٠٠٠٠ من السكان في عام ٢٠٠٧، بلغت ذروة المرض ٤٤: ١٠٠٠٠٠من السكان في عام ٢٠٠٨ثم بدأ المرض في الانخفاض بعد ذلك ليصل المعدل إلى ٤: ١٠٠٠٠٠من السكان في عام ٢٠١٦. خلالال سنوات الخمس الأولى من الدراسة (٢٠٠٧- ٢٠١١)، فان معدل حدوث المرض للفئة العمرية أقل من ١٥ عاما (٣٠,٩٪)، في حين أن المعدل للفئة العمرية ١٥ سنة فأعلى تمثل (٦٩,١٪). بلغت نسبة المرضى الذكوروالإناث ٨٢,٤٪ و ١٧,٦٪ على التوالي. خلال النصف الثاني من الدراسة (٢٠١٢-٢٠١٦) فان معدل حدوث المرض للفئة العمرية أقل من ١٥ عاما (٢١,١٪)، في حين أن المعدل للفئة العمرية ١٥ سنة فأعلى تمثل (٦٩,١٪) .بلغت نسبة المرضى الذكوروالإناث ٨٢,٤٪ و ١٧,٦٪ على التوالي.

المستخلص: أن اتجاهات حدوث داء الليشمانية الجلدية في المجمعة ، المملكة العربية السعودية انخفضت خلال السنوات العشرالماضية . المرض أكثرانتشارا بين الفئة العمرية الأكبر سنا والسعوديين والذكورالا أن الإصابة بالمرض بين الإناث زادت بشكل ملحوظ خلال السنوات الخمس الأخيرة من الدراسة

Introduction

Leishmaniasis remains a major public health problem; with an estimated global burden of 12 million cases and a yearly incidence of 1.5–2 million cases. During the past 10 years, there has been a sharp increase in the number of recorded cases of the disease worldwide. In addition, a substantial number of cases are not recorded, as notification of the disease is compulsory in only 32 of the 88 affected

countries[1,2]. Although the disease is ranked ninth in terms of burden to the population as a single entity but remains neglected when addressed along with other infectious dieases.[3,4] In Saudi Arabia, the disease is caused by Leishmania major in central and eastern provinces and Leishmania tropica in west and southwest provinces. The main vector of Cutaneous Leishmaniasis is Phlebotomus sergenti, and the disease affects males more than females[5,6,7]. Cutaneous Leishmaniasis attained epidemic proportions in 1973 and subsequently declined and reached a plateau in the mid-1980s [8]. In a retrospective study in Riyadh region between 1987 and 1990 Cutaneous Leishmaniasis incidence rate declined from 244.2 to 106.5 per 100,000 populations[9]. During the year 2000-2010, Cutaneous Leishmaniasis in the Eastern Region of Saudi Arabia showed higher incidence rate among males compared to females, it also showed declining trend among Saudi while increasing in expatriates [10]. Urbanization and extension of the cities, as the case in Saudi Arabia is a main risk factor. Other associated factors also found in Saudi Arabia are migration from rural to urban areas, socioeconomic, cultural, demographic, environmental changes as well as climatic disturbances[11].

The objective of this study was to determine the reporting trend of cutaneous Leishmaniasis in Majmaah, Saudi Arabia between 2007 and 2016

Research methods

The research design was descriptive, institutional-based to study the trend of occurrence of Cutaneous Leishmaniasis in Majmaah, Saudi Arabia. The study was conducted in Majmaah city. Majmaah is the capital of Majmaah governorate in Riyadh Region in Saudi Arabia. The area of Majmaah governorate is around 30 000 square kilometers. The population of the governorate is about 97,349. Majmaah Governorate borders the Eastern Province and Al-Qassim on the north, Thadiq and Shagra on the south and Ramah to the east. The governorate borders Zulfi and al-Ghat on the west [12]. King Khalid General Hospital is the main specialized hospital in Majmaah governorate; the hospital provides different specialized services for patients transferred from other hospitals, the primary health care centers as long as from the private health facilities. The patients suffering from dermatological illnesses in the area are referred to the department of dermatology in the hospital for specialized care and reporting.

Medical records of Cutaneous Leishmaniasis patients registered and treated at King Khalid Hospital, Majmaah, Saudi Arabia during 2007-2016 were reviewed and considered in this study. The surveillance database of cutaneous Leishmaniasis at the regional Vector Control Unit, Local Health Directorate, in Riyadh, Saudi Arabia was also used in this study.

The data were collected by a pre-tested check list. The data were edited at the field and during data entry, cleaned, summarized using a master sheet and doubled entered into the

computer. The SPSS for Windows software, version 21 (SPSS, Chicago, Illinois, USA) was used to analyze the data. Descriptive statistics were used (frequency and standard deviation). Comparisons between qualitative variables were made using the person's Chi-square to test significance. P value less than 0.05 was considered significant. Ethical approval was obtained from the ethical committee of Majmaah University. All the data and information regarding this study were kept confidential and utilized only for the purpose of this study.

Results

Table (1) shows the social characteristics of patients with Cutaneous Leishmaniasis; patients less than 5 years of age were 10(11.5%), between 5 and 14 years were 17 (19.5%), between 15 and 44 years were 44 (50.6%) and more than 44 years were 16 (18.4%). The mean age of patients was 26.3 years. In this study, females constituted 78.2% and 21.8% respectively. Fifty-four patients (62.1%) were Saudi while 33 (37.9%) were non-Saudi. 29 (28.7%) of the patients were farmers, twenty-two (25.3%) were students, 16 (18.4%) were laborers, housewives/ no jobs were 6(6.9%). Other occupations constitute (13.8%). Most of the patients (95%) reside in Majmaah province.

The analysis showed that most of the patients had lesions which were dry (81.7%) while 34.9% of the participants showed secondary infection of the lesion seen in table (2).

Figure (1) shows the trend of the occurrence of Cutaneous Leishmaniasis in Majmaah, Saudi Arabia. The reported incidence of the disease was 33:100000 populations in 2007 and reached a peak 44:100000 populations in 2008 then started to decline to reach 4:100000 populations in 2016.

Table (3) shows the association between Cutaneous Leishmaniasis and social factors. In the first five years of the study (2007-2011), patients less than 15 years of age were 21(30.9%) while those 15 years of age and more were 47 (69.1%). In the second half of the study (2012-2016), patients less than 15 years of age were 4(21.1%) while those 15 years of age and more were 15 (78.9%); the above association is not significant (p=0.11).

During 2007-2011, the male and female patients with cutaneous Leishmaniasis were 82.4% and 17.6% respectively; while during 2012-2016,the ratio of male to female patients was 63.2% and 36.8% respectively; this association was statistically significant (p=0.002).

During 2007-2011, the Saudi patients diagnosed with cutaneous Leishmaniasis were 61.8% while non-Saudi patients were 38.2%; while during 2012-2016, this ratio of Saudi and non-Saudi patients was 63.2% and 36.8% respectively, this association was not significant (p=0.84).

Table (1): Social characteristics of patients with Cutaneous Leishmaniasis (n= 87)

Social characteristic	Number	Percent
Age:		
Less than 5	10	11.5
5-14	17	19.5
15-44	44	50.6
More than 44	16	18.4
Gender:		
Male	68	78.2
Female	19	21.8
Nationality:		
Saudi	54	62.1
Non-Saudi	33	37.9
Occupation:		
Farmer	25	28.7
Student	22	25.3
Laborers	16	18.4
Housewives	6	6.9
No job	6	6.9
Others	12	13.8
Residence in Majmaah province:		
Yes	83	95.8
No	04	4.2

Age: Min- max (years) = 3-90

Mean age (years) = 26.3

Table (2):

Characteristics of Cutaneous Leishmaniasis Lesion (n=87)

Social characteristic	Number	Percent
Ulcer:		
Dry		
Moist	71	81.7
Presence of secondary infection:	16	16..3
Yes		
No	57	34.9
	30	65.1

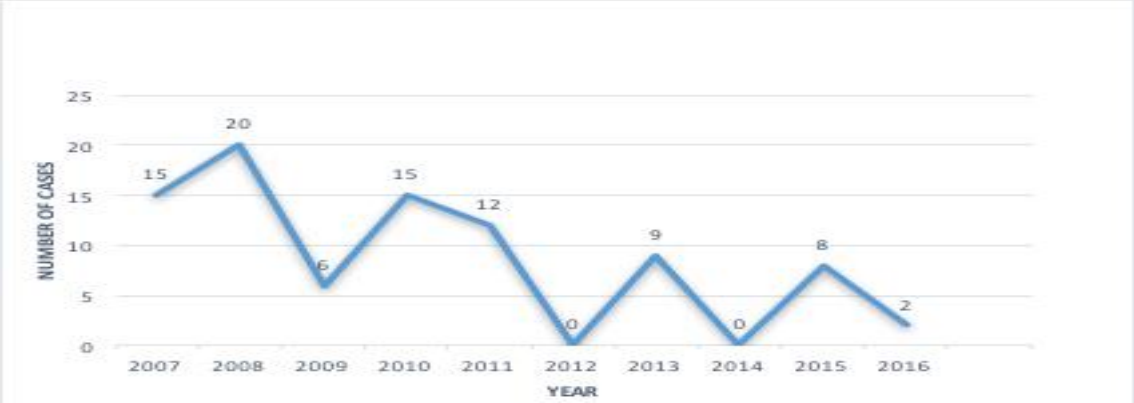


Fig. (1) Cuteaniuon Leishmaniasis trends in Majmaah 2007-2016

Table (3):

Cutaneous Leishmaniasis trends according to social characteristics

Social characteristic	Cases/years		Total	P
	(2007-2011) No. (%)	(2012-2016) N0. (%)		
Age/ years:				
Less than 15	21(30.9%)	4 (21.1%)	25(28.7%)	
15 and more	47(69.1%)	15(78.9%)	62(71.3%)	0.11
Total	68(100.0%)	19(100.0%)	87(100.0%)	
Gender:				
Male	56 (82.4%)	12(63.2%)	68(78.2%)	
Female	12(17.6%)	7(36.8%)	19(21.8%)	0.002
Total	68(100.0%)	19(100.0%)	87(100.0%)	
Nationality:				
Saudi	42 (61.8%)	12(63.2%)	54(62.1%)	
Expatriates	26 (38.2%)	7(36.8%)	33(37.9%)	0.84
Total	68(100.0%)	19(100.0%)	87(100.0%)	

Discussion

Eighty-seven patients diagnosed with Cutaneous Leishmaniasis between 2007 and 2016 in Majmaah, KSA were included in this study. The total number of patients during 2007-2011 were 68 patients while during 2012-2016 were 19 patients there is a significant decrease (percentage), with highest peak in 2008 (20 patients) and no reported cases in 2012 and 2014.

This total number of cases seems to be low and some cases may not be diagnosed due to under reporting. The remained untreated cases may act as a reservoir driving new transmission[13].In the current study most of the reported lesions were dry[14]. This finding is consistent with conducted in Yemen in 2009 by Khatri ML et al.

Results showed that the disease is more prevalent among the 15-44 years age group; this finding is consistent with other studies [15, 16, 14]. A study conducted in Afghanistan in 2010 by Reithinger R showed that cutaneous Leishmaniasis reported incidence increases with age up to 15 years, after which prevalence levels off due to the acquisition of immunity[17].

The disease showed declining trends between 2007 and 2016; the same trends was seen in some areas of the Middle East including Saudi Arabia [19, 16]. The main reason that could be attributed to this decline is the launch of the national control program head by Ministry of health, and the team work headed between Majmaah Health Care System and the regional Vector Control Unit. The main focus of the program is interrupting the disease transmission by controlling the vector by means of insecticide spray, use of insecticide–treated nets and control of animal reservoir hosts at suspected areas whenever there is reporting of a new case. The program is in collaboration with WHO and adopting its guidelines. Another factor in the decline of cases could be duo to under reporting. In other parts of the world the disease showed an increased trend[20,15]. According to our study, no cases of cutaneous Leishmaniasis were reported in the years 2012 and 2014. This finding is consistent with the ministry of health data that in the year 2014 all regions of Saudi Arabia reported only eight cases[21].

Our findings showed that the reported incidence of the disease is more prevalent among male gender compared to females; this finding is in line with other studies as males are more exposed to transmission of the disease due to their occupation and recreational social gathering in farms[22,23,24]. During 2007-2011 the females with the disease were very low but this number increased dramatically during 2012-2016; this increase in female compared to male patients is significant (p=0.002), decline trends among females was seen elsewhere [24].The rate of the disease among expatriates did not increase between 2007-2011 and 2014-2016; this finding contradicts another study conducted at Al Hassa in Saudi Arabia [16].

Conclusion

The findings of this study concluded that the trends of occurrence of Cutaneous Leishmaniasis in Majmaah, Saudi Arabia declined during the past ten years. The disease was more prevalent among the older age group, the Saudis, and the male gender: However, the incidence of the disease among the females increased significantly during the last five years of the study. The study recommends application of an active surveillance system for Cutaneous Leishmaniasis and include the disease management, control and reporting at the primary health care level.

Acknowledgement

The author would like to acknowledge the Regional Vector Control Unit, Local Health Directorate, Ministry of Health, Riyadh, Saudi Arabia; the Deanship of Scientific Research, Majmaah University, Saudi Arabia and the Basic and Health Research Center, Majmaah University for supporting this research. I would like to thank Dr.Usamah Waheed at the Regional Vector Control Unit, Mr. Gassi Aldagani from Supervision office of the primary health care, Majmaah and Mr. Abdul-Aziz Almutairi from King Khaled hospital in Majmaah for their support.

Financial support and sponsorship

This work was supported by the Deanship of Scientific Research, Majmaah University, Saudi Arabia.

Conflicts of interest

The author declares that, there is no conflict of interest regarding this research.

References

1. Postigo JA (2010) Leishmaniasis in the World Health Organization Eastern Mediterranean Region Int J Antimicrob Agents 36 Suppl 1: S62–S65.

2. WHO. Leishmaniasis. Fact sheet N°375. Updated February 2015. (On line). From:http://www.who.int/mediacentre/factsheets/fs375/en/. (Accessed on 3.4.2017)

3. Reithinger R, Dujardin JC, Louzir Het al. Cutaneous Leishmaniasis.Lancet Infect Dis2007;7: 581–596.

4. Hotez PJ, Remme JH, Buss P, Alleyne G, Morel C, et al. Combating tropical infectious diseases: report of the Disease Control Priorities in Developing Countries Project. Clin Infect Dis. 2004;38:871–878. [PubMed

5. Al-Zahrani M, Peters W, Evans D, Smith V, Chin Chin I (1989) Leishmania infecting man and wild animals in Saudi Arabia. 6. Cutaneous Leishmaniasis of man in the south-west. Trans R Soc Trop Med Hyg 83: 621–628. Doi: 10.1016/0035-9203(89)90376-3. pmid:2617623

6. Bounoua L, Kahime K, Houti L, Blakey T et al. Linking climate to incidence of zoonotic cutaneous leishmaniasis (L. major) in pre-Saharan North Africa. Int J Environ Res Public Health. 2013 Jul 31; 10(8):3172-91.

7. WHO. Cutaneous Leishmaniasis in Saudi Arabia. Neglected Tropical Disease. (On line) From: http://www.emro. Who. int/neglected-tropical-diseases/countries/cl-saudi.html Accessed on 3.4.2017

8. Al-Tawfiq JA1, AbuKhamsin A. Cutaneous leishmaniasis: a 46-year study of the epidemiology and clinical features in Saudi Arabia (1956-2002 Int J Infect Dis. 2004 Jul;8(4):244-50.

9. Al-Shammari SA1, Khoja TA, Fehr A. Cutaneous leishmaniasis in Riyadh region: four-year study of the epidemiologic and clinical features. Int J Dermatol. 1992 Aug;31(8):565-7.

10. Al_Majmaah, Saudi Arabia (online) From: https://en.wikipedia.org/wiki/Al_Majma%27ah (accessed on 12.12.2016)

11. Kamhawi S, Modi GB, Pimenta PF, Rowton E, Sacks DL. The vectorial competence of Phlebotomus sergenti is specific

for Leishmania tropica

12. Al_Majma'ah, Saudi Arabia. En.wikipedia.org/wiki/Al_Majma'ah. From: https://www.google.com.sa/

13. Ashford R. Cutaneous Leishmaniasis in Kabul: observations on a prolonged epidemic. Ann Trop Med Parasitol. 1992; 86:361–71. [PubMed]

14. Khatri ML, MuccioTD, Gramiccia M. Cutaneous Leishmaniasis in North-Western Yemen: A clinic epidemiologic study and Leishmania species identification by polymerase chain reaction–restriction fragment length polymorphism analysis. Journal of the American Academy of Dermatology 2009; Volume 61 (4): 15–e21

15. Hamza V Y, Khademi N. Trend of Cutaneous Leishmaniasis in Kermanshah Province, West of Iran from 1990 to 2012. Iran J Parasitol. 2015 Jan-Mar; 10(1): 78–86. Doi: 10.1016/S1995-7645(13)60116-9.

16. Amin TT, Al-Mohammed HI, Kaliyadan F, Mohammed BS. Cutaneous Leishmaniasis in Al Hassa, Saudi Arabia: epidemiological trends from 2000 to 2010. Asian Pac J Trop Med. 2013 Aug; 6(8):667-72. Doi: 10.1016/S1995-7645(13)60116-9.

17. Reithinger R, Mohsen M, Leslie T. Risk Factors for Anthroponotic Cutaneous Leishmaniasis at the Household Level in Kabul, Afghanistan. PloSNegl Trop Dis. 2010 Mar; 4(3): e639. Doi: 10.1371/journal.pntd.0000639.

18. World Health Organization (2014) WHO Leishmaniasis Resource: Saudi Arabia. Available: www.who.int/leishmaniasis/resources/SAUDI_ARABIA.pdf Accessed 27 March 2017.

19. Salam N, Al-Shaqha WM and Azzi A. Leishmaniasis in the Middle East: Incidence and Epidemiology. PLoS-Negl Trop Dis. 2014 Oct; 8(10): e3208 Doi: 10.1371/journal.pntd.0003208

20. Bekele S, Bekele Y, Mulatu F, Lemma T, Tilahun H, Gadisa E, Negussie S, Yamuah L, Wassie L, Abebe M, Hiletework M, Hunegnaw M, Leekassa R, Bizuneh E. Recent trends of cutaneous Leishmaniasis in Alert Hospital, Addis Ababa. Ethiop Med J. 2014 Jan; Suppl 1:37-41.

21. El-Beshbishy HA, Al-Ali KH, El-Badry AA (2013) Molecular characterization of cutaneous leishmaniasis in Al-Madinah Al-Munawarah province, western Saudi Arabia. Int J Infect Dis 17: e334–e338 [PubMed]

22. Araujo AR, Portela NC, Feitosa APS, da Silva OT, Arraes RA, XIMENES RA, Alves LC and Brayner FA. Risk factors associated with American Cutaneous Leishmaniasis in an endemic area of Brazil. Rev Inst Med Trop Sao Paulo. 2016; 58: 86. Doi: 10.1590/S1678-9946201658086

23. Aara N, Khandelwal K, Bumb RA, Mehta RD, Ghiya BC, Jakhar R, Dodd C, Salotra P, Satoskar AR. Clinco-Epidemiologic Study of Cutaneous Leishmaniasis in Bikaner, Rajasthan, India. Am J Trop Med Hyg. 2013 Jul 10; 89(1): 111–115. Doi: 10.4269/ajtmh.12-0558

24. Hadad MHF, KassiriH , Kasiri N, A, Lotfi M. Prevalence and epidemiologic profile of acute cutaneous Leishmaniasis in an endemic focus, Southwestern Iran. Journal of Acute Disease 2015; Volume 4 (4): 292–297