WHO EMRO | Epidemiological status of leishmaniasis in the Islamic Republic of Iran, 1983–2012

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الوضع الوبائي لدا ء الليشمانيات في جمهورية إيران الإسلامية، 1983-2012

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: إن داء الليشمانيات له تاريخ طويل في جمهورية إيران الإسلامية . وقد هدفت هذهالخلاصة
الدراسة إلى إظهار اتجاهات حدوث داء الليشمانيات من عام 1983 إلى عام 2012 وإلى وصف
الخصائص الوبائية لحالات عام 2012. ففي دراسة استعادية مقطعية تم استخراج البيانات
المتعلقة بالأنماط السريرية الثلاثة للمرض من النظام الوطني لترصد داء الليشمانيات -
الجلدي (حيواني المصدر والمقصور على البشر) والحشوي (حيواني المصدر). فكان متوسط العدد
السنوي لحالات داء الليشمانيات الجلدي 18 884 (متوسط الحدوث السنوي 32 حالة لكل 000
100 نسمة). وفي عام 2012 كانت أعلى معدلات الحدوث لدى الفئات العمرية 1-4 و 5-9 سنوات (43
و 40 لكل 100 000) ، وكانت العدوى لدى الذكور (57 %) أكثر من الإناث (43 %). وكان متوسط
العدد السنوي لحالات داء الليشمانيات الحشوي حيواني المصدر 175 (متوسط الحدوث السنوي
18.0 لكل 100 000). لقد انخفضت معدلات حدوث داء الليشمانيات الجلدي والحشوي حيواني
المصدر في السنوات الأخيرة بالتزامن مع الجهود الوطنية لمكافحة داء الليشمانيات .

ABSTRACT Leishmaniasis has a long history in the Islamic Republic of Iran. This study aimed to show the trend in leishmaniasis incidence from 1983 to 2012 and to describe the epidemiological characteristics in 2012. In a retrospective cross-sectional study, data were extracted from th%e national leishmaniasis surveillance system for the 3 clinical types—cutaneous (zoonotic and anthroponotic) and visceral (zoonotic). The average annual number of cutaneous leishmaniasis cases was 18 884 (average annual incidence 32 cases per 100 000 inhabitants). In 2012 the highest incidences were in age groups 1–4 and 5–9-years (43 and 40 per 100 000), and more males (57%) than females (43%) were infected. The annual average number of zoonotic visceral leishmaniasis cases was 175 (average annual incidence 0.18 per 100 000). The incidences of cutaneous and zoonotic visceral leishmaniasis have decreased in recent years, which coincides with national leishmaniasis control efforts.

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Situation épidémiologique de la leishmaniose en République islamique d'Iran, 1983–2012

RÉSUMÉ La leishmaniose a une longue histoire en République islamique d'Iran. La présente étude visait à montrer la tendance de l'incidence de la leishmaniose entre 1983 et 2012 et de décrire les caractéristiques épidémiologiques en 2012. Dans une étude rétrospective transversale, des données ont été extraites du système national de surveillance de la leishmaniose pour les trois types de cas cliniques — cutanée (zoonotique et anthroponotique) et viscérale (zoonotique). Le nombre annuel moyen de cas de leishmaniose cutanée était de 18 884 (incidence annuelle moyenne de 32 cas pour 100 000 habitants). En 2012, les incidences les plus fortes étaient observées dans les tranches d'âge d'un à quatre ans et de cinq à neuf ans (43 et 40 pour 100 000 respectivement), et davantage de patients de sexe masculin (57 %) que de sexe féminin (43 %) étaient infectés. Le nombre annuel moyen de cas de leishmaniose viscérale zoonotique était de 175 (incidence annuelle moyenne de 0,18 pour 100 000). L'incidence de la leishmaniose viscérale cutanée et zoonotique a diminué ces dernières années, ce qui coïncide avec les actions de lutte nationales contre la maladie.

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Received: 13/10/14; accepted: 24/05/15

Introduction

Leishmaniasis is an endemic parasitic disease in 98 countries of the world, and has a wide spectrum of clinical manifestations, affecting over 12 million people globally. It is caused by several pathogenic species of Leishmania (1,2) with an average annual incidence of 1.0–1.5 million cases of disfiguring cutaneous, the most common form of the disease, and 500 000

cases of the visceral form (3,4). Previous studies have indicated that 4 epidemiological clinical features of the disease (zoonotic and anthroponotic cutaneous leishmaniasis and zoonotic and anthroponotic visceral leishmaniasis) are predominantly found within the World Health Organization (WHO) Eastern Mediterranean Region (EMR).

Anthroponotic cutaneous leishmaniasis caused by Leishmania tropica occurs in Afghanistan, Islamic Republic of Iran, Iraq, Morocco, Pakistan, Saudi Arabia, Syrian Arab Republic and Yemen (5). On the other hand, zoonotic cutaneous leishmaniasis caused by Leishmania major occurs in rural areas and is geographically distributed in the Middle East, north-western China and North Africa (4). Zoonotic visceral leishmaniasis caused by Leishmania infantum has been reported in many countries in the EMR, such as Afghanistan, Egypt, Islamic Republic of Iran, Iraq, Jordan, Lebanon, Libya, Morocco, Pakistan, Saudi Arabia, Syrian Arab Republic, Tunisia and Yemen (5,6).

Leishmania major, the causative agent of zoonotic cutaneous leishmaniasis, is endemic in many rural areas of the Islamic Republic of Iran, involving 17 out of 31 provinces (7) (Isfahan, Bushehr, Khuzestan, Ilam, Fars, Qom, Khorasan Razavi, Khorasan Shomali, Khorasan Jonoobi, Golestan, Yazd, Hormozgan, Kerman, Semnan, Systan and Baluchistan, Lorestan and Tehran provinces) (8). The foci of anthroponotic cutaneous leishmaniasis are active in some large cities and suburban areas of the country, such as Mashhad, Sabzevar and Neishabour (north-east); Kerman, Shiraz and Bam (south); and Kashan, Isfahan and Yazd (centre) (9).

Zoonotic visceral leishmaniasis cases are mostly reported from Fars in the south, Azarbaijan Sharghi and Ardabil in the north-west, Lorestan in the west, Khuzestan in the south-west and

Khorasan Shomali in the north-east (7,10). No anthroponotic visceral leishmaniasis cases caused by L. donovani have been reported in the Islamic Republic of Iran. A summary of the above can be seen in Table 1 (11,12).

Epidemiological data are important in the control and management of leishmaniasis in endemic areas. The information can help to identify the parasite cycle and its ecological and clinical features. The objectives of this study were to plot the annual incidence of cutaneous and visceral leishmaniasis in the Islamic Republic of Iran from 1983 to 2012 and to describe the epidemiological characteristics of the disease in 2012. The data are expected to help public health policy-makers in the planning and use of resources in this and other countries.

Methods

A retrospective, cross-sectional study was carried out using data from the national leishmaniasis surveillance system. The communicable diseases control organization of the Iranian Ministry of Health is responsible for surveillance and collection of data on communicable diseases from various districts of the country. Leishmaniasis surveillance data have been collected over 30 years from 1983 to 2012. From 1986 to 2000 data were recorded and reported in paper format and from 2000 to 2006 based on Epi-info, version 6 software. Online reporting was launched in 2006 for limited districts and in 2012 the data were gathered online from 355 districts.

The data collected for this survey included individual and geographical information, laboratory data and treatment methods for all cases of anthroponotic cutaneous leishmaniasis and visceral leishmaniasis. Case definitions were based on the national control guidelines for cutaneous and visceral leishmaniasis. The zoonoses department is a subset of the communicable diseases control organization and similar information for zoonotic cutaneous and anthroponotic leishmaniasis were accessed and analysed by this department. Ethical approval for the study was obtained from the national leishmaniasis expert committee.

The data were analysed using SPSS software, version 16.0, and Microsoft Excel 2007 at the communicable diseases control organization.

Results

Cutaneous leishmaniasis

Trends in incidence 1983–2012

The data on all types of leishmaniasis in Islamic Republic of Iran were collected from 1983 to 2012. Over this period the total number of cases reached 569 164 and of these 566 532 (99.5%) were cutaneous leishmaniasis (zoonotic and anthroponotic types). This was an annual average number of cutaneous leishmaniasis cases of 18 884 and annual average incidence of 32 per 100 000 inhabitants over the 30-year period.

The trend in cases of cutaneous leishmaniasis from 1983 to 2012 is illustrated in Figure 1 , showing the number of cases and incidence per 100 000 inhabitants. The highest incidence of cutaneous leishmaniasis was reported in 1984 at 47 per 100 000 inhabitants and the lowest in 1992 at 20 per 100 000 inhabitants. In 2004, which was 1 year after the occurrence of the destructive earthquake in Bam, there was a large increase in the incidence of cutaneous leishmaniasis to 40 per 100 000. From 2005 to 2012, the incidence stabilized.

Epidemiological profile in 2012

Figure 2 illustrates the distribution of cutaneous leishmaniasis cases (zoonotic and anthroponotic) in each province of the country in 2012. In that year, 20 947 cases were recorded, a total incidence of 27.2 cases per 100 000 inhabitants. Ilam, Fars and Khorasan Razavi provinces had the highest incidence rates at 98.7, 86.8 and 81.9 per 100 000 (2.9%, 21.6% and 25.5% of the total number of cases) respectively.

The highest annual incidence of new cutaneous leishmaniasis in 2012 occurred in August, with 2971 cases (14.1%), while the lowest rate was reported in April, with 640 cases (3.1%). There were markedly higher incidence rates in the age groups 1–4 and 5–9 years (43 and 40 per 100 000 respectively), whereas rates in those aged 60 years ranged from 22 to 29 per 100 000. The sex distribution of cases showed that 56.6% of cases were among males and 43.3% among females. The great majority of cases (95.8%) were among those of Iranian nationality, while 4.0% were Afghan, 0.2% Pakistani and 0.01% Iraqi.

The treatment methods used showed that 65.8% of cases took a combination of meglumine antimoniate (Glucantim®) locally with cryotherapy, 29.2% systemic meglumine antimoniate, 1.4% cryotherapy and 3.6% non-standard therapies. In terms of response to local and systemic therapy 45.1% of cutaneous leishmaniasis cases were cured, 50.9% improved, 0.8% failed and 3.2% were unknown.

Visceral leishmaniasis

Trends in incidence 1998–2012

Data on visceral leishmaniasis were available from 1998 to 2012. A cumulative total of 2632 zoonotic visceral leishmaniasis cases were recorded, 0.5% of the total 569 164 cases of leishmaniasis. The annual average number of cases was 175.4 over the 14-year period and the annual average incidence was 0.18 per 100 000 inhabitants.

Figure 3 shows the trend of visceral leishmaniasis cases from all districts in the country from 1998 to 2012. The incidence of visceral leishmaniasis increased until 2000 and decreased steeply afterwards. The peak incidencewas recorded in 2000, at 0.55 cases per 100 000 inhabitants (13.15% of the total cases from 1998 to 2012).

Epidemiological profile in 2012

In 2012, 106 cases of visceral leishmaniasis was recorded (0.1 cases per 100 000). Most cases were recorded in the north (Ardebil, Azarbaijan Sharghi and Khorasan Shomali provinces) and in the south (Fars province). Fars province had the highest number with 34 cases (32.0%) (Fig ure 4).

The seasonal data show that the highest number of cases recorded was 18 cases (19.3%) in April and 14 cases (15.1%) in July. There were a high number cases in the age group 1–3 years, with 55 cases (41.5%). Slightly more males (54.1%) than females (45.9%) were affected.

Discussion

WHO considers leishmaniasis as one of the most serious parasitic diseases, and the World Health Assembly has advocated a focus on its control (4). However, due to the complex epidemiological transition cycle of the disease (various reservoirs and vectors with complex ecological patterns), surveillance and control are difficult.

This study showed the trend in

cutaneous leishmaniasis incidence in the Islamic Republic of Iran from 1983 to 2012 and the epidemiological status in 2012. We recorded an annual average of 18 884 cases of cutaneous leishmaniasis over the 3 decades of the survey and an annual average incidence of 32 per

100 000 inhabitants, although other estimates of the burden of disease are 4–5-fold greater (10). In 2012, the last year of the survey, the national incidence was 27 cases per 100 000 inhabitants, and the highest rates were in Fars and Khorasan Razavi provinces (86 and 82 cases per 100 000 respectively).

A review of the trend of cutaneous leishmaniasis in the Islamic Republic of Iran, before the establishment of new control measures showed that the factors which could explain the increase in cases included migration of (non-immune) people from non-endemic areas to endemic foci; the expansion of human habitation in the areas near gerbil colonies; migration of gerbils to human habitats; the variety of rodent species in the Islamic Republic of Iran; extended cultivation in the rural areas causing a rise in rodent breeding and migration; climate change and drought; lack of knowledge about the disease; and preventive activities within the community (8).

Similar to other studies of cutaneous leishmaniasis (12), the most commonly affected age group in our survey was 1–4 years (43 cases per 100 000), followed by 5–9 years (40 cases per 100 000). The reason might be sensitivity to infection in children. Cutaneous leishmaniasis also affected slightly more males more than females, which may be a result of the greater likelihood of skin exposure to mosquito bites among men.

We have reviewed the evidence from other EMR countries. Afghanistan has the highest prevalence of cutaneous leishmaniasis worldwide, with approximately 13 million people at risk of the disease. About 17 000 new cases are reported in Kabul, representing 40% of the total annual incidence. Girls, women and children under 15 years old comprise 80% of the total number of confirmed cases annually in the country (13). Pakistan has a high burden of cutaneous and visceral leishmaniasis, whereas the mucocutaneous form is almost non-existent. It is crucial for physicians to know the diagnostic criteria as well as the treatment of the disease. Most of the patients refer to general medical practitioners, because of the scarcity of dermatologists in the rural areas. Disease management is further complicated by inadequate supplies of appropriate drugs (14). In Saudi Arabia cutaneous leishmaniasis is more common and 45% of cases occur among foreigners. Most cases occur at ages 15–44 years and cutaneous leishmaniasis caused by L. major has been reported in several areas of the country. Different factors have led to an increase in transmission, including rapid urbanization, migration, intense agriculture, poor living conditions on farms and massive immigration. The number of cases was reduced rapidly after the setting up of a national control programme. In 2008, 29 of the 32 visceral leishmaniasis cases occurred in Jazan region (15).

Leishmaniasis has appeared as a severe epidemic disease in some towns and cities in Saudi Arabia (16), similar to what was observed after the Bam earthquake in the Islamic Republic of Iran in 2003, when the prevalence of anthroponotic cutaneous leishmaniasis increased sharply and reached an epidemic level in 2006 (10).

With effective implementation of practical control interventions, we can potentially prevent the transmission of leishmaniasis. Although cutaneous leishmaniasis cases rose sharply in 2004, following the devastating earthquake in Bam, the incidence of cutaneous leishmaniasis stabilized after 2005, presumably due to the nationwide introduction of control policies in the Islamic Republic of Iran in 2007 (10). The sharp decrease in the number and incidence of visceral leishmaniasis cases after the year 2000 also coincides with the implementation of leishmaniasis control programmes (16).

Elsewhere in the EMR, in Tunisia, there was a significant decrease in the annual incidence of cutaneous leishmaniasis through the implementation of control interventions over the previous 4

years, to approximately 30 out of 100 000 individuals per year (13). Nevertheless, there is still a need for long-term assessment to confirm the declining trend.

The main elements of cutaneous and visceral leishmaniasis control programmes in the Islamic Republic of Iran have focused on the establishment of a national committee for leishmaniasis control, are as follows (7,16):

strengthening the leishmaniasis surveillance system and establishing a laboratory network from the national to peripheral level;

establishment of standard diagnosis and treatment centres;

provision of educational programmes for different social levels and revision of the national guideline, standardization of case definition and treatment results;

early diagnosis and rapid treatment of patients accompanied by dressing wounds to prevent sandfly bites, reservoir control programmes, collecting the rubble and rubbish tips and vector control programmes;

applying direct agglutination test in periphery levels for visceral leishmaniasis diagnosis and identification and collection of infected owned and stray dogs in visceral leishmaniasis endemic foci;

intersectional coordination with related organizations and institutions.

There were some limitations in the recording and reporting of the data in our study, as patients in endemic areas might not take medicines prescribed because they believed the disease was curable, not all patients had laboratory testing and were diagnosed by clinical manifestations. In addition, some patients may have taken traditional medicines and these would not be registered.

Acknowledgements

We kindly appreciate the leishmaniasis experts in the provincials and districts levels in Iran for supporting the surveillance system. We would also like to thank Dr F. Modaber, the Drugs for Neglected Diseases initiative expert in Geneva for his valuable comments and Nika Mohanak for editing the manuscript.

Funding: The funding for this research was supported by the Centre for

Communicable Diseases Control, in the Iranian Ministry of Health and Medical Education.

Competing interests: None declared.

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