

TECHNICAL REPORT

Cutaneous leishmaniasis in Jordan: a need assessment

Amman, South Shuneh, Al-Azraq, Ajloun (Jordan), 14-19 May 2017

Objectives

The overall objective of the mission was to carry out a situation analysis on cutaneous leishmaniasis in the country, following a request by MoH Jordan through WHO Jordan, as originally proposed and planned in the Joint Collaboration Programme 2016-2017 between WHO and MoH. Its aims included to review the epidemiology of cutaneous leishmaniasis in Jordan and the control measures currently implemented in the country, and to provide MoH Jordan with advice in regard to the above.

The mission was led by an expert in leishmaniasis, Prof. Riadh Ben-Ismaïl, from "Institut Pasteur" in Tunis, as WHO Temporary Adviser, accompanied by Dr Albis Francesco Gabrielli, Regional Adviser, NTD, WHO/EMRO, and by Dr Lora AlSawalha and Dr Akram Wajih, WHO/Jordan.

The mission consisted of meetings in Amman, travel to endemic areas and meetings with local health authorities, and was concluded by a national workshop attended by all actors working in leishmaniasis in Jordan. As an outcome of the workshop, recommendations were formulated.

1. BACKGROUND

Cutaneous leishmaniasis is endemic in some geographical areas of Jordan, where its epidemiology and distribution are generally well known. The disease is known in Jordanian dialect as "gwedha" - a reference to the traditional treatment of the lesions, based on heating or burning).

The most common form is zoonotic cutaneous leishmaniasis due to *L. major*, present in several rural foci especially along the River Jordan valley (lowlands) and the desert areas in southern Jordan (vector: *Ph. papatasi*; reservoir: rodents, *Psammomys* spp. (proven)/*Meriones* spp. (suspected)).

Cutaneous leishmaniasis due to a zoonotic population of *L. tropica* is also present, mainly in highland areas in the northern governorates of Irbid and Ajloun. In similar foci located in neighbouring countries the sandfly proven vectors are *Ph. sergenti* and *Ph. arabicus*, both known to be present in the Jordanian foci. The reservoir hosts are unknown in Jordan but are likely to be the rock hyrax (*Procapra capensis*), a small herbivorous mammal, as well as wild and domestic canids as demonstrated in similar foci in neighbouring countries.

Jordan is up to date free from the anthroponotic, urban and epidemic form of cutaneous leishmaniasis that is highly endemic in almost all the western part of Syria from north to south. Anthroponotic cutaneous leishmaniasis (ACL) in Syria is caused by a different variant of *L. tropica*.

Evaluating/predicting the risk associated with this endemic anthroponotic form becoming established in Jordan due to the introduction of the parasite by Syrian refugees is a major concern for MoH.

The sandfly season in Jordan occurs between May and end of October.

Transmission of zoonotic cutaneous leishmaniasis due to *L. major* is known to reach a peak during late summer (September - October), while most cases are detected during the winter (October to February), in reason of the short incubation period (2 weeks-2 months). As the duration of *L. major* lesions is short (few months), most lesions are healed by June, even if not treated.

In regard to the *L. tropica* zoonotic cutaneous leishmaniasis form occurring in Jordan, the maximum transmission peak period, as well as the incubation period and lesion duration, are unknown.

Details on transmission of the *L. tropica* ACL form are known in Syria. It occurs during 2 peak periods (June and September) and the incubation period is longer (several months to 1 year). The lesions remain active for up to 5 years before healing. In some rare *L. tropica* ACL cases, leishmaniasis recidivans (LR) or chronic relapsing (CL), the disease follows a chronic and relapsing course, recurring at the site of an original, apparently healed lesion after a variable period (months or years). LR lesions may be notoriously difficult to treat and constitute the hidden reservoir of the anthroponotic *L. tropica*.

Overall, 200-300 cases of cutaneous leishmaniasis are reported every year from Jordan. Since 2012, a progressive increase in number of reported cases has been observed, largely due to the inflow of refugees from Syria (the country is endemic for both anthroponotic form (*L. tropica*) and zoonotic forms (*L. major*) of cutaneous leishmaniasis. As mentioned, importation of cases infected in Syria has been accompanied by alarm on the possible introduction and transmission of the Syrian anthroponotic form into Jordan.

2. ACTIVITIES

2.1. Meetings at Ministry of Health, Amman (14 May)

Discussions were held at the Zoonotic and Parasitic Disease Department and at the Directorate for Communicable Diseases.

Leishmania control activities are managed by the Zoonotic and Parasitic Disease Department, although a leishmaniasis control programme as such does not exist in Jordan (unlike the case of malaria and schistosomiasis for example).

Case-management practices are influenced by the non-availability of antimonial medicines on the Jordanian market. Sodium stibogluconate is always provided by MoH to all requesting physicians (WHO has been donating medicines, but always to MoH). Both Pentostam (sodium stibogluconate - SSG - produced by GSK) and generic SSG by Albert David have been provided by MoH to requesting physicians.

Nevertheless, not all primary health care doctors/dermatologists are familiar with use of antimonials: intra-lesional treatment is unfrequently administered and systemic treatment is rarely reported in

Jordan. Cryotherapy is more frequently used, although liquid nitrogen is not always readily available, and in spite of the reported occurrence of unpleasant scars and higher risk of recidives. It was agreed that capacities of primary health-care doctors and dermatologists would need to be strengthened with regard to WHO recommendations/algorithms on the selection of the most appropriate management of CL, with regard to actual injection of antimonials, as well as with regard to case-reporting practices. This activity could take the shape of dedicated workshops.

Surveillance was also discussed. MoH states that statistics are affected by underreporting. This is partly due to the low importance given to CL lesions by some of the patients themselves (especially when such lesions are small/few), and partly to low reporting practices by care providers, especially private dermatologists. Jordan is transitioning from a paper-based to an electronic surveillance system, which is progressively being expanded. With regard to CL, both systems are still in place. Discrepancies between the two systems occur as the electronic system (into which data are entered through handheld tablet devices) is not yet covering all treatment centres and the private sector. Discrepancies are going to progressively disappear as the electronic system reaches full coverage; in the meanwhile it is important to reconcile figures. Also, although the electronic system allows for separate entries for "cutaneous leishmaniasis" and "visceral leishmaniasis", in the online summary tables data for the two diseases are merged. On the contrary, data should always be presented as disaggregated, as the two two diseases are very different. As a note, the burden of VL appears modest, as only 21 cases have been reported since 1962, including 4 pediatric cases among Syrian refugees detected in 2014 and 2015).

2.2. Meeting at Central Public Health Laboratory (CPHL), Amman (14 May)

The CPHL is part of the MoH and coordinates a network of 6 laboratories across Jordan. Diagnosis of leishmaniasis (direct smear and culture) is only carried out at CPHL, Royal Medical Services (army's health services), plus a few private laboratories. As such suspect patients from public health facilities are referred to CPHL from all over the country, although most diagnoses are made on clinical grounds only, especially in rural areas (this is in compliance with Jordan's policy, which does not require laboratory confirmation). The need to decentralize leishmaniasis diagnostic services was discussed with MoH staff. It was suggested that capacities in 3 additional laboratories (in northern, southern and central lowlands areas) should be built, and the laboratories equipped so that direct smear would be available at peripheral level too. Training activities can be conducted by CPHL staff through dedicated workshops.

2.3. Visit to South Shuneh district, Balqa governorate (15 May)

A visit was paid to the endemic focus of L. major located in South Shuneh districts, in the lowlands along the Jordan River and the border with the West Bank. The health directorate, the hospital and a health centre were visited. Approximately 100 new cases are reported from this area every year, although it is expected that other cases do not contact health centres because of the small attention given to the lesions (L. major lesions are often of small size, in lower parts of the body, and tend to heal spontaneously, usually after 3 to 6 months). Most cases are of young age, showing a pattern that is typical of endemic areas, and is explained by the fact that older individuals are immunized due to infections acquired earlier in their life. The local hospital offers dermatology consultancies twice a week.

Diagnosis is mainly clinical, although patients with unclear clinical picture are sent to the CPHL in Amman for confirmation. Although SSG is available, the local dermatologist rather relies on cryotherapy, reportedly with good results. The staff in the local health centre informed us that whenever a patient with suspect CL is found, he or she is sent to the hospital for diagnosis and treatment. The hospital is therefore the reference centre for all cases occurring in the area. A visit was paid to the nearby "Jesus' baptism site" which is a major tourist attraction located within the focus, on the banks of River Jordan. Because of its position, working staff and pilgrims living in the area for some time are at risk of being affected by cutaneous leishmaniasis. An inspection of the surrounding environment led to the identification of several burrows compatible with habitats of *Psammomys* spp. as well as to the observation of the widespread presence of chenopods, the halophytic plants that are the only food source for these rodents.

2.4. Visit to Al-Azraq Refugee Camp, Zarqa governorate (16 May)

The camp is located approximately 100km east of Amman and was opened to Syrian refugees in 2014. It currently hosts 35,000-40,000 children and adults (50%-50% approximately), originating from different areas within Syria (Daraa, Aleppo, Homs, etc.). Most of the population resettled at the camp between 2014 and 2016. Number of cases of CL detected in the camp was 155 in 2016. Diagnosis is made at health centres within the camp; only one physician in the whole camp is trained to administer treatment. SSG is provided by MoH upon request and is the only anti-leishmanial treatment available in the camp. Cryotherapy is not available.

Resettling populations might arrive at the camp already with CL lesions (due to *L. tropica* or *L. major*); these lesions are certainly acquired in Syria. However, they might develop lesions following their arrival to the camp. In this case, it is important to conduct interviews with patients with the aim of analyzing the clinical presentation, time of appearance/onset of lesions, transmission season and incubation period in relation to the patient's movements. Assessments conducted in this regard indicate that it is likely that most CL infections are actually acquired by patients either at their place of origin in Syria or within that country while on their way to Jordan. In this regard, it would be important to build capacities of health staff within the camp on management of peculiar clinical forms of *L. tropica* present in Syria, such as leishmaniasis recidivans.

On the other hand, the risk of introduction of the Syrian anthroponotic form of *L. tropica* in the camp area, and in Jordan generally, should be evaluated, so as to prevent any risk of outbreaks (this could be done by assessing if the *Ph. sergenti* present in Jordan can transmit the parasite). Such risk appears generally low as preliminary assessments conducted by MoH within the camp in May 2017 did not indicate presence of *Ph. sergenti*, although the sandfly was collected in the surroundings (Azraq village, about 20km East of the camp) in the 1980s (but was not found during a survey in 2014). In general, distribution of *Ph. sergenti* in Jordan appears limited (Arajan, Mowoqqar, Barha, Bushra and Azraq) (Kanani et al., 2015).

Local transmission of *L. major* should also be investigated, as several burrows suitable to host colonies of *Meriones* spp. are present in the camp, and one rodent was observed nearby them during our visit. Also,

the whole ecological environment within which the camp is located, is compatible with presence of *Meriones* spp.. With regard to vectors: while no *Ph. papatasi* sandflies could be found in the camp during the survey in May 2017, a recent entomological survey and review (Kanani et al.,2015) of all sandfly surveys carried in Jordan from 1929 to 2015, indicate that *Ph. papatasi* was reported from Azraq village as recently as 2014.

2.5. Visit to Ajloun, Ajloun governorate (17 May)

This highland area located in north-western Jordan hosts a few foci of zoonotic cutaneous leishmaniasis due to *L. tropica*. The proven animal reservoirs in neighbouring countries are the rock Hyrax (*Procapra capensis*) and domestic and wild canids, but this has to be confirmed in Jordan. Zoonotic *L. tropica* can be considered the ancestor of anthroponotic *L. tropica*; the parasite is not well adapted to humans and infection occurs sporadically (it is not outbreak-prone, unlike the anthroponotic form). The few cases observed during our visit were scattered, at the edge of the villages or in isolated dwellings, far one from each other (and therefore beyond sandfly flight distance), thus excluding any possibility of anthroponotic transmission. The pattern of lesions was different from that of ACL (which is usually characterized by single, small, dry, lesions of the face). In 2 cases in Ajloun, lesions were often humid and numerous and affecting the face but also the limbs. Approximately 30/40 cases are seen at Ajloun hospital every year. The most affected villages/sites are Halawa, Osara and Baoun, all within a few kilometres from the city. Diagnosis is only made on clinical grounds; patients with unclear clinical presentation are sent to the CPHL in Amman for smear confirmation. SSG is provided by MoH upon request and is the only treatment available in Ajloun. No cryotherapy is available. It was mentioned that patients from rural areas might frequently not complete a full course of treatment (in reason of its long duration requiring multiple visits to the hospital), which is a risk factor for development of resistance. A few patients were seen, including a young man with several lesions on many parts of the body, including the face. It was decided to refer two patients to Amman for further epidemiological investigation (typing of the *Leishmania* species) and for appropriate case management.

2.6. National workshop on leishmaniasis, Landmark Hotel, Amman (18 May)

The last day of the mission was dedicated to a workshop with all stakeholders working on leishmaniasis in Jordan. During the workshop the findings of the mission were presented, situation/gap analysis was discussed, and recommendations were formulated, as shown below.

3. GAP ANALYSIS

Organizational management

1. Absence of a dedicated leishmaniasis control programme (although activities are managed by the Zoonotic and Parasitic Diseases Department)
2. Lack of national guidelines on diagnosis and management of leishmaniasis

Surveillance and case detection

3. Late health-seeking behavior due to limited awareness among general population
4. Late diagnosis due to varied diagnostic capacities and/or low access to diagnostic facilities
5. Limited reporting especially from the private sector
6. Discrepancies between the electronic reporting system and the paper/vertical reporting done by the Zoonotic and Parasitic Diseases Department (especially with regard to refugee camps and private sector)
7. CL and VL in the electronic reporting system are not separated as two distinguished diseases.

Diagnosis

8. Centralization of diagnostic services (only CPHL and few other private laboratories can carry out laboratory confirmation); most diagnoses are clinical only

Treatment

9. Both cryotherapy and SSG are available in Jordan but not widely accessible, especially at peripheral level; treatment is usually administered at hospital level, not at health centre level; compliance to full treatment might be low in some cases, especially in rural areas; procurement of antileishmanial medicines is irregular and frequently on an ad-hoc basis, to fill immediate needs

Prevention

10. Limited implementation of vector and reservoir control interventions

Operational research issues

11. Limited information on the vectorial capacity of the Jordan populations of *Ph. sergenti* to transmit Syrian strains of *L. tropica*
12. Reservoir host of the Jordanian zoonotic *L. tropica* unknown

4. RECOMMENDATIONS

1. Implement capacity building of primary health care doctors and dermatologists on the diagnostic algorithm and the management of cutaneous leishmaniasis, in line with the WHO "Manual for case management of cutaneous leishmaniasis in the WHO Eastern Mediterranean Region". The Arabic version of the mentioned manual should be widely printed and distributed. Brochures and posters on leishmaniasis for health centres should be developed and printed.
2. Implement building of diagnostic capacities on leishmaniasis in at least 3 laboratories (in northern Jordan, mid/lowlands and southern Jordan) to ensure decentralization of this service.

3. Develop and update yearly procurement plans for sodium stibogluconate (SSG) to ensure wide availability of this medicine throughout Jordan.
4. Sensitize communities living in endemic foci on leishmaniasis so as to raise awareness and ensure prevention, early case detection and management; seasonality of transmission/appearance of lesions as well need to comply with full treatment protocol should be emphasized; health education material should be developed, printed and distributed to this effect
5. Conduct operational research studies to assess risk of establishment of anthroponotic cutaneous leishmaniasis due to *L. tropica* within Jordan (vectorial capacity studies)
6. Institutionalize inter-sectoral collaboration for vector and reservoir control; consider ecologically friendly environmental modifications in selected sites (areas at highest risk and tourist sites): on the short-medium term, destruction of rodent burrows by ploughing before the transmission season; on the long term, modification of the biotope by planting salt resistant trees
7. Engage MoH in discussions on the establishment of a leishmaniasis unit within the Zoonotic and Parasitic Diseases Department, with a regular budget allocation
8. Ensure differentiation between cutaneous and visceral leishmaniasis in Jordan's electronic surveillance/reporting system

5. REFERENCES

Khanani KA, Amr ZS, Shadfan B, Al-Abdallat M (2015). Recent Collection of Sandflies of the Genus *Phlebotomus* (Diptera: Psychodidae) from Jordan, with a Checklist of Previous Records. *Jordan Journal of Biological Sciences*, 8(3):193-197

6. KEY PERSONS MET/ORGANIZATIONS VISITED:

Ministry of Health, Jordan

Dr Mohammed Al-Abdallat, Director of Communicable Diseases Directorate

Dr Khalil Kanani, Consultant in Community Medicine, Parasitic and Zoonotic Diseases Department

Dr Bassam Shadfah, Head, Parasitic and Zoonotic Diseases Department

Dr Sami Sheikh Ali, Head, Data Analysis, Communicable Diseases Directorate

Dr Mahmoud Al-Gazou, Deputy Director, Central Public Health Laboratory

Mr. Naim Daoud, Head Laboratory Technician, Central Public Health Laboratory

WHO

Dr Maria Cristina Profili, WHO Representative, Jordan

Dr Lora AlSawalha, National Professional Officer, WHO/Jordan

Dr Akram Wajih, National Professional Officer, WHO/Jordan

Prof. Riadh Ben-Ismaïl, Institut Pasteur, Tunis (WHO Temporary Adviser)

Dr Albis Francesco Gabrielli, Regional Adviser, NTDs, WHO/EMRO

Agenda of visit to Jordan for Leishmaniasis needs assessment 14-19 May, 2017, Amman, Jordan

Day 1 14\5	9:00-9:30	- Courtesy visit and short briefing with WR Jordan	- WHO \WR Office
	10:00-11:00	- Technical Meeting with MOH, Leishmaniasis Focal Points and staff (to discuss CL situation and objectives of the mission).	- MOH \Zoonotic Disease Department Dr Khaleel Kanani and Dr. Bassam Shadfan
	11:30-12:30	- Visit to Public Health Lab.	- Meeting with the laboratory staff and visit to Leishmaniasis Unit (Dr Asia Aladwan, Dr. Mohammed Al-Gazou, Mr Naim Alsarawi).
	13:00-15:00	- Visit to Directorate of Communicable Diseases at MOH	- Meeting with director of communicable diseases, Dr. Mohammed Abdallat - Meeting with the head of Data Analysis Division, Dr. Sami Al-Sheikh
Day 2 15\5	9:00-15:00	- Field visit to South Shuneh Health District in the Low Lands.	- Meeting at South Shuneh Health District Directorate - Visit to South Shuneh Hospital/meeting at Dermatology Clinic - Visit to Baptism site (active focus of <i>L. major</i>) - Visit to Sweimeh Health Center (hyperactive focus of <i>L. major</i>)
	15:00	- Back to Amman	
Day 3 16\5	9:00 - 15:00	- Field visit to Al-Azraq Syrian Refugee Camp	- Meeting with MOH public health focal point. - Visit to UNHCR health Clinic - Meeting with some Syrian refugees affected by CL
	15:00	- Back to Amman	
Day 4 17\5	9:00-15:00	- Field visit to Ajloon Health District	- Meeting with Ajloon Health Director and public health doctor - Visit to Princess Basma Hospital and meeting with the dermatologist Dr. Yasser Massadeh - Field visit to some villages endemic for <i>L. tropica</i>
	15:00	- Back to Amman	
Day 5 18\5	9:00-15:00	- National workshop with participation of most national partners and stakeholders	- All sectors involved in Leishmaniasis activities will be invited to participate in the work shop (Public Health, Public central lab.,

		involved in Leishmaniasis activities.	Animal Health, Representatives of Health care providers at Refugee camps, Academia, Royal medical Services, UNHCR representatives, private sectors). - Recommendations and needs - Priority activities - Stakeholders mapping
	15:00	- Short report to WR on the mission. -	- Prof. Riadh Ben-Ismaïl

Leishmaniasis needs assessment national workshop

Thursday 18 May 2017 at Landmark Hotel, Amman-Jordan

9:00 – 9:30	Registration	
9:30 – 10:00	Opening	Ministry of Health Representatives WHO Representative
10:00 – 10:30	Surveillance and distribution of CL in Jordan	Dr. Bassam Shadfan
10:30 – 11:00	Coffee break	
11:00 – 11:30	Epidemiological aspects of Leishmaniasis in Jordan	Dr. Khalil Kanani
11:30 – 12:00	Diagnostic capacities of Leishmaniasis at CPHL and needs	Dr. Mahmoud Al Gazou
12:00 – 12:30	Management of Cutaneous Leishmaniasis	Dermatologist
12:30 – 13:00	Review of Leishmaniasis studies and coordination between MOH and Academia	Prof. Zuhair Sami Amer
13:00 – 13:30	Molecular diagnosis of Leishmaniasis at Hashemite University of Jordan, joint research with MOH	Prof. Nawal Hijawi
13:30 – 14:30	Lunch Break	
14:30 – 15:30	Need assessment of leishmaniasis in Jordan (findings, needs and recommendations).	WHO/TA, Prof. Riadh Ben-Ismaïl
15:30	Closing	MOH representative WHO representative