

Turkey as a crossroads for *Leishmania* species: genotypic identification reveals the presence of four *Leishmania* species in autochthonous cases of cutaneous leishmaniasis

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OBJECTIVES: Turkey is situated on the crossroads between Asia, Africa and Europe. Its subtropical climate makes it a suitable environment for leishmaniasis, where almost 15,000 cutaneous leishmaniasis (CL) cases were reported between 2005 and 2012. Initially, *Leishmania tropica* and *L. infantum* were the only causative agents of CL in Turkey. However, *L. major* and *L. donovani* were recently identified in CL cases, but without any information whether they were local or imported cases. Determination of *Leishmania* species in clinical cases is crucial for the management of treatment. Here, we present our list of 201 autochthonous CL patients diagnosed in Turkey in recent years, together with basic information about the cases and their genotypic assessment results.

METHODS: Patients have been admitted to hospitals across Turkey, with one or more delicate skin lesions. CL diagnosis relied initially on the clinical manifestation, followed by microscopic examination of Giemsa-stained lesion samples and cultivated lesion sample in NNN medium. Real time PCR that targeted ITS-1 region of *Leishmania* spp. was applied to all samples. Lesions of atypical samples were inoculated into Balb/C mice for diagnosis. Treatments were managed by the clinicians.

RESULTS: A total of 201 CL cases were identified in different provinces in Turkey (Figure 1). Male patients were slightly more than females (107 vs. 94), and the leading lesion site was the face (n=133; 66.2%). Number of lesions on the patients were mostly one or two (n=166 in total; 82.6%). RT-PCR results indicated *L. tropica* (n=148; 73.7%), *L. major* (n=24; 12.0%), *L. infantum* (n=19; 9.5%) and *L. donovani* (n=10; 5.0%). All atypical cases inoculated into mice were found to be positive for leishmaniasis.

CONCLUSION: The most striking result of the study is probably the identification of four causative agents of CL in autochthonous cases in Turkey, where only *L. tropica* and *L. infantum* have been noted. The second leading species was *L. major*, which is well-documented in severe, debilitating CL in mice, and should be considered during the management of patients. The presence of *L. donovani* and *L. major* may be seen as a sign of potential elevation of autochthonous visceral leishmaniasis cases in coming years, which are relatively low today. Since all presented cases were local people, with no reported history of recent visits to endemic neighbouring countries such as Iran, Syria or Iraq, public health measures should urgently be implemented to prevent the transmission of leishmaniasis together with large-scale projects that will reveal the reservoirs and vectors of leishmaniasis in Turkey [These samples are kept as cryopreserved in the Parasite Bank located in Celal Bayar University in Manisa, Turkey. This study was supported by the Department of Scientific Research Projects of Celal Bayar University (Projects No: 2013-002; 2013-003 and 2014-022)].