European Journal of Epidemiology (2019) 34:611–612
https://doi.org/10.1007/s10654-019-00492-8

CORRESPONDENCE

Cystic echinococcosis in unaccompanied minor refugees from Afghanistan and the Middle East to Germany, July 2016 through June 2017

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Received: 17 December 2018 / Accepted: 2 February 2019 / Published online: 9 February 2019

Abstract
Cystic echinococcosis (CE) is not covered by current refugee screening protocols. After we had detected CE among several refugees attending our clinic from Afghanistan and the Middle East, serological examinations for CE were performed for apparently healthy unaccompanied minor refugees from these regions.

Keywords *Echinococcus granulosus* · Cystic echinococcosis · Refugees · Afghanistan · Middle East · Syria · Lebanon · Iraq

In 2016, the proportion of asylum seekers in Germany from Syria was 36.9%, from Iraq 13.3% and from Afghanistan 17.6%. Screening for medical problems of refugees revealed parasitic diseases, mainly giardiasis but screening for cystic echinococcosis (CE) was not part of the examination protocols [1].

CE is a helminthic disease due to the cestode *Echinococcus (E.) granulosus* which is transmitted from infected dogs to humans by accidental ingestion of worm ova excreted with canine feces. It is highly prevalent in countries where dogs have easy access to slaughter waste of infected intermediate hosts such as sheep, goats or pigs [2]. This occurs particularly in rural regions of Afghanistan and the Middle East where livestock is slaughtered at home and dogs are fed with uncooked offal. Systematic investigations on the incidence of CE in this region are scarce but recent reports suggest a prevalence of up to 15.6% in human populations [2, 3]. In 2016, several patients from these regions were referred to our service either for clinical management or for the performance of serology in the parasitological laboratory of our institute. One of these patients was a Lebanese adolescent who, although having undergone routine health screening before, had not been diagnosed at that time for having CE. Later, the patient experienced acute nausea, tachycardia and dyspnea after fitness training. Diagnostic work-up revealed an intracardial and a pulmonary echinococcal cyst. He was treated surgically, followed by antihelminthic therapy. Due to the aforementioned case and the increased number of CE patients referred to our institute, screening of apparently healthy unaccompanied minor refugees (UMRs) from these countries for CE was begun.

Mandatory routine infectious and parasitic diseases screening of UMRs arriving in Berlin performed in our institute has been described in detail previously [2]. Initial health inspection, tuberculosis screening and school entrance examination are performed elsewhere.

138 UMR's from Afghanistan, 41 from Syria, and 39 from Lebanon were screened serologically with three serologic tests each: an *E. granulosus-E. multilocularis*-ELISA (Euroimmune, Lübeck, Germany), an in-house-ELISA for *E. granulosus*, and an IHAT for *E. granulosus* (Siemens, Marburg, Germany). Subjects with positive or doubtful serologic test results underwent abdominal ultrasonography. Further diagnostic work-up comprised a chest-X-ray, and other imaging methods depending from the clinical presentation.

The total number of CE cases recorded in our service from July 2016 through June 2017 was 22: 7 from Afghanistan, 5

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from Turkey, 3 from Syria, 3 from the Balkans, and 1 from Iraq, Lebanon, Russia and Mali, respectively. Ten cases (1 female, 9 male, age 13–17 years [median 16]) of CE were identified in UMRs: 7 of 138 screened patients (5.07%) from Afghanistan, 2/41 (4.88%) from Syria, 1/39 (2.56%) from Lebanon. In 8/10 patients, cysts were detected by ultrasonography and/or other imaging techniques, 2/10 had serologic evidence of a past or abortive infection. 13 typical liver cysts were detected in eight patients of whom five had multiple cysts. Active or transitory liver cysts comprised WHO stage CE1: 4 cysts, CE2: 2 cysts, CE3a: 2 cysts, and CE3b requiring therapy [3]. Only one liver cyst was inactive (CE4). One patient had 2 lung cysts. Two patients had splenomegaly. 5/10 patients were asymptomatic and were identified by screening, only. Another UMR had indicative symptoms for CE (urticarial rash after an abdominal trauma), four had non-specific symptoms.

This first report on CE in UMRs from Middle Eastern and Central Asian countries reveals that CE is present in this population confirming that CE is overlooked when current screening protocols are applied [1]. The aforementioned case of an UMR with a cardiac and pulmonary echinococcal cyst illustrates the life-threatening potential of these cases. The prevalence of CE found by screening corresponds to the scarce reports on the prevalence of CE in the originary countries of the UMRs of the present series [4, 5]. Previous studies on the results of screening of apparently healthy refugees from the Middle East and Afghanistan reported intestinal parasitic diseases in approximately 25% of UMRs including giardiasis 7.9–12% and geohelminthic infections including ascariasis, trichuriasis, hymenolepiasis and, strongyloidiasis in 2.4–4.8% of UMRs [1]. In the present case series, CE was the most prevalent helminthic infection with the highest pathogenic potential. Furthermore, screening for CE is even more important as most of the UMRs were asymptomatic and for its serious potentially life-threatening complications. It is noteworthy, that apparently only a part of these cases was notified to the central public health board of Germany. This means, that the increase of CE cases would have passed unnoticed.

Concluding, CE is a serious infection, which refugees from the Middle and Central East should be screened for routinely. Thereby, early diagnosis is achieved which enables timely curative therapy to prevent potentially lethal complications of CE.

Acknowledgements There was no specific financial support. The cases described have been observed in a clinical routine context. We would like to thank the patients and their guardians for their cooperation and support.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

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