Reviewer's report

Title: Characteristics and risk factors for Giardia lamblia infections in Germany

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Reviewer: Lucy Robertson

Reviewer's report:

This is an interesting and useful study which seeks to analyse which of the Giardia infections notified to the authorities in Germany are autochthonous, and risk factors associated with these infections. The study is certainly worthy of publication and the data are provided are of interest. However there are various points which I believe should be addressed by the authors before the manuscript is published. These revisions are of the minor essential/discretionary type, although I think that some discussion around the 2 genotypes (point 5) is very important/essential.

1) It is frequently noted in the Giardia literature that symptomatic cases of giardiasis may be acute, with the sudden onset of severe diarrhoea and other intestinal problems, or there may be a prolonged illness with intermittent bouts of diarrhoea followed by apparent recovery lasting until the next bout of diarrhoea. The reasons for this cyclicity in symptoms are not properly understood at present, although associations with particular giardia genotype have been suggested, although probably the true picture is more complicated. This prolonged manifestation may follow a period of months or even longer. Thus, for those patients who decide to visit their doctor after a recurrence of symptoms in a case with prolonged clinical picture may have been infected long before the 3 week exposure period, as defined in this study. Although the authors partially address this point with the additional question on foreign travel in the 12 month period prior to symptom onset, I think that this point should be made more clearly.

2) In the case-control study more information is needed regarding the two matched controls per case. In what respects were the controls matched with the cases – age? Sex? Water supply? Socio-economic position? Level of education? Employment? All these variables may possibly impact on likely exposure/infection. However, I perhaps understand from the paragraph that the controls were only matched by age and county of residence. Is this correct? This needs to be clarified. It would perhaps have been interesting to have had controls which had a diarrhoeal infection during the same period as the case, but diagnosed as being of non-Giardia aetiology, however I can appreciate that this would not have been simple to organise.

3) I understand from the first paragraph of the results that over 8% of cases notified do not meet clinical case definition. This seems a very high proportion to me. What is the reason for the notification if there has been no lab diagnosis and no link to a lab-confirmed case? This requires some clarification or comment.
4) A relatively high number of cases required hospitalisation. Some further information on the reason for hospitalisation would be interesting (were these cases with other diseases, impaired immunity, or particularly elderly/young).

5) There are no comments or discussion on the two different genotypes of Giardia (A and B) which are infective to humans are made throughout the manuscript. Whilst I realise that information on the genotype of the majority of the infections is probably unavailable, I think that there is room for appropriate comment in the discussion.

6) It is mentioned that lettuce may be contaminated by irrigation water contaminated by human waste. What about animal waste? Is this a plausible route? It is mentioned in the discussion that ‘assemblages in animals apparently do not cause symptoms in humans’ (with a reference) – but it should be noted that although the majority of animal infections are probably with genotypes which are not infective to humans (particularly in domestic animals and pets), this is certainly not exclusive, and genotypes of Giardia infective to humans have been isolated from a range of domestic and wild animals.

7) Comparison with autochthonous/travel-related case ratio from other European countries. Comparison of similar data from other similar countries to Germany would be very interesting, and more in depth discussion regarding risk factor studies from other comparable countries (I believe that there are a few from New Zealand).

8) English language: whilst I appreciate that the first language of the authors is not English, I think that the quality of the paper would be very much improved if the text could be corrected by a native English speaker so that small grammatical errors, with which the text is peppered, could be corrected.

I enjoyed reading this manuscript and believe the data presented are interesting and though provoking and an important contribution to our understanding of giardiasis in industrialised countries. I commend the authors and look forward to seeing the final publication.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests