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Potential sexual transmission of *Giardia* in an endemic region: a case series

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SUMMARY

We present four cases in which probable sexual transmission of *Giardia lamblia* was suspected.
Diagnosing this mode of transmission in endemic areas is often difficult and should be considered only as possible, because exposure to poor sanitation and a potentially contaminated environment are always latent. However, as patients reported, there was no history of drinking tap water, exposure to recreational water, eating contaminated food, or other potential sources of infection but anilingus with an infected partner. We consider that in endemic countries, even when other more frequent modes of transmission could be playing the main role, the possibility of (re) infection due to sexual transmission should not be forgotten.
Talking openly with patients, strengthening patient-specific preventive measures and counselling appear to be needed to reduce risks of *Giardia* infection transmission due to this often neglected route.

Keywords: *Giardia*, giardiasis, sexual transmission, HIV, diarrhoea, combination therapy.

INTRODUCTION

Giardia lamblia, the aetiological agent of human giardiasis, is a protozoan widespread throughout the world and it is estimated that infects approximately 5-10% of the world´s population, especially in low- and middle-income countries where the prevalence rates may range from 4-43% [1, 2]. *Giardia* transmission mainly occurs when faecal excretion of cysts by ill persons or healthy carriers is followed by oral ingestion of contaminated water or food by a susceptible host.

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In the same way, faecal-oral transmission can occur within households, daycare centres and custodial institutions, and in those people who include and practice anilingus in their sexual repertoire, especially in men who have sex with men (MSM) [3-6]. *Giardia* is often an asymptomatic -or self-limited- infection of the upper small intestine. When symptomatic, this infection presents with non-specific manifestations like diarrhoea, abdominal pain, anorexia, nausea, vomiting, weight loss, and increased flatulence [7]. Were these reasons not enough, the value of the recent *Giardia* research is increased by the recognition that this protozoan has been linked to irritable bowel syndrome and chronic fatigue [8].
Relatively non-specific clinical features of this disease lead to diagnostic difficulties. High indexes of

suspicion by clinicians, as well as thorough evaluation using sensitive techniques, are essential to diagnose this infection. Treatment of giardiasis is based on 5-nitroimidazole compounds (mainly metronidazole and tinidazole), nitazoxanide and albendazole (ABZ). When treatment fails to cure, a number of factors must be considered, including re-infections, medication non-compliance, resistance, etc. [7].

While in endemic areas the main sources of *Giardia* infection seem to be water- or food-borne, other modes of infection including sexual transmission could have a role in transmission. Herein we report our experience with 4 cases, living in an endemic region in which the sexual transmission was considered as possible.

CASE REPORTS

Case 1: A 35-year-old healthy woman started with diarrhoea, hives, abdominal pain of several days'duration; mild nausea and a decreased appetite. On physical exam her abdomen was diffusely tender to palpation. There was no obvious rash seen. Up to three faecal specimens were requested and *Giardia* cysts were observed. She was treated with secnidazole (SCZ) with resolution of symptoms and three negatives faecal specimens in follow up consultation. Four weeks later, she started with similar symptoms and *Giardia* cysts were found in faecal specimens again. On repeated questioning, exposure to persons with diarrhoeal illness or to contaminated food and water were ruled out. However, she stated that had heard that *Giardia* could be transmitted sexually -by receptive vaginal intercourse-, and someone told her that if she had giardiasis, maybe her husband should receive treatment at the same time. We denied this route of transmission, but on continued questioning, she stated that she enjoyed actively performing anilingus during the sexual intercourse with her husband. Her husband was invited to attend to the consultation. He was asymptomatic but when he was parasitologically examined, *Giardia* infection was confirmed, too. Other family members, who lived in the same house, were parasitologically examined and were negative for *Giardia* cysts in faecal specimens. The patient and her husband were given giardiasis treatment at the same time with a single dose of SCZ, which resulted in parasitological cure. She had completely recovered, with resolution of her symptoms and both, she and her husband remained well.

Case 2. A 24-year-old healthy MSM noticed a change in bowel habits, with increased frequency and decreased consistency of faeces. Yellowish foul watery diarrhoea, 3-4 times a day, abdominal pain and a decreased appetite were the main clinical manifestations. These started around 10 days after a sexual encounter with an adult male with whom he sporadically had sexual encounters. He was very concerned about the possibility of *Giardia* infection because his occasional partner had had giardiasis no less than 4 times before. He denied both receptive and insertive anal intercourse; however, they practiced fellatio and anilingus without protection, considering these less risky practices in relation with HIV infection. Exposure to contaminated food and water were ruled out. The findings of a physical examination revealed moderated periumbilicar tenderness. Faecal specimens for ova and parasites, and modified acid-fast staining were requested. HIV testing was also offered. HIV tests were negative and modified acid-fast staining was negative for intestinal coccidia. After microscopic detection of *Giardia* cysts in faecal specimens, metronidazole (MTZ) was prescribed for 5 days to the patient and he received the recommendation of abstaining anilingus without protection. In the follow up, his faecal examination were negative for ova and parasites. He improved clinically with resolution of diarrhoea, and weight gain. Despite history of recurrent giardiasis, his sporadic sexual partner had been asymptomatic throughout the patient's evaluation and management. He was invited to attend to the doctor office and to be examined for intestinal parasites. He was also confirmed to be infected with *Giardia* and successfully treated with a 7-day course of MTZ.

Case 3: A 56-year-old, HIV-infected MSM (11 years diagnosed, receiving treatment with HAART the last 5 years with apparent adherence) with a past medical history of hypertension and asthma, started complaining with abdominal pain, diarrhoea, flatulence and weight loss. The findings of a physical examination were unremarkable, only diffuse abdominal tenderness. At the faecal examination it was found

Giardia and *Entamoeba coli* cysts. Modified acid-fast staining of faecal specimens was negative for intestinal coccidia. A thorough history revealed no potential source of infection other than sexual. He protected himself avoiding drinking unboiled water or eating food out of his house in order to prevent enteric parasitic infections that may complicate his HIV seropositive status. He practiced protected anal intercourse (both receptive and insertive). He participated in group sex, used sex toys and also practiced anilingus without protection. He had been previously diagnosed with intestinal amoebiasis, enterobiasis and hepatitis A. He was asked about the health of his most recent partner and he stated he used to have recurrent *Giardia* infection. The patient was initially and successfully treated with MTZ for 5 days, parasitologically confirmed by faecal tests for ova and parasites, three weeks later, on the day of their follow-up visit. A month later, symptoms reappeared, he reported being with 3 nights history of severe pruritus ani; enterobiasis was suspected; however, it was not confirmed. The patient reported a sexual encounter with the same last partner and having had active anilingus with him, again. Three additional faecal specimens were requested. Once again exposure to contaminated food and water were ruled out. *Giardia* cysts were found again and he was successfully treated with MTZ and ABZ, both for 5 days and repeating 200 milligrams of ABZ after 15 days, according to the guidelines for the treatment of *Enterobius vermicularis* infections. Additionally, he was recommended abstaining anilingus without protection. Apart from mild nausea and bitter taste he tolerated the treatment well. Within several days after therapy, he improved clinically with resolution of diarrhoea, and weight gain. He achieved a complete parasitological cure. His occasional partner was invited to attend to the consultation but he never came.

Case 4: A 21-year-old healthy MSM attended with his 28-year-old male partner to the doctor´s office. Both were complaining with recurrent abdominal pain with moderate intensity, increased flatulence, diarrhoea and weight loss. They had visited a camping in the countryside and drank unboiled water a month before. They stated anilingus without protection as a common sexual practice. The findings of their physical examination were normal. HIV testing was offered to both, and was negative. Up to three faecal specimens were requested and *Giardia* cysts were observed. Once etiological diagnosis was established, they were counseled about *Giardia* and its mode of transmission. Also, it was prescribed MTZ for 7 days for the patient and his partner, and the recommendation of drinking boiled water and abstaining anilingus until three negative faecal specimens after completion of a 7 day course of MTZ were obtained. Only the 21-year-old patient attended to follow up and the three faecal specimens requested revealed the complete parasitological cure. However, three weeks later, he re-attended with symptoms again. The findings of his faecal examination revealed *Giardia* cysts again. On repeated questioning, it appeared that the 28-year-old male partner had only taken MTZ for three days, time in which resolution of abdominal pain and diarrhoea occurred and he stopped taking the drug. So, they recommenced their sexual activities including mutual anilingus without protection. A repeat course of the same therapy led to a complete parasitological cure in both men. They improved clinically with resolution of diarrhoea, and weight gain. The complete parasitological cure was achieved.

DISCUSSION

Giardia is a common and globally distributed intestinal protozoan, although this infection is mainly observed in developing countries. It is the commonest intestinal parasitic protozoan infection in Cuba, where the highest prevalence has been found in children [9]. According to Cuban studies, despite the high proportion of the population who lives with improved water supplies, water seems to play a major role in the transmission of this protozoan [10]. In the present case series, the mode of transmission in each instance was thought to be probably via faecal oral contact during anilingus, a common risk factor found in the cases reported.

Direct transmission from person to person is an established mode of transmission for some enteric pathogens including *Shigella*, *Entamoeba*, *Enterobius*, and *Giardia* when there is an oral contact with the perianal area, previously contaminated with faeces [6, 11-13]. As our cases live in endemic areas,

diagnosing this mode of infection is often difficult and should be considered only as possible; however, the sexual route appears to have provided the necessary link for transmission in each one of our 4 cases, according to the each case history.

In endemic areas, sexual transmission of *Giardia* infection may be underappreciated, due to the continuous exposure to a potentially contaminated environment because of poor hygienic conditions. That is why in these regions, the sexual transmission of *Giardia* infection is hard to be distinguished from other routes of transmission. However, it might be more common than is currently recognized, especially if the sexual repertoire of couples is taken into consideration. In addition, although this route has been mainly reported in homosexual males, anilingus may be a practice carried out independent of sexual orientation, as in our first case.

It is important to highlight that our 4 cases were highly motivated and we were able to form a close doctor-patient relationship throughout their period of diagnosis, treatment and follow up to talk in an open manner. We were therefore almost confident of excluding other potential sources of reinfection but anilingus. They denied history of exposure to drinking tap water, eating contaminated food or contact with diaper-age children, neither exposure to recreational contact with fresh water.

HIV/AIDS awareness may have a side-effect on the transmission of *Giardia* and other enteric parasitic infections, due to the HIV transmission through the oral route is considered uncommon [14]. In this way, because of the perceived "relative safety" of oral sex, in comparison to other types of sexual behaviour, oral sexual practices have been prevalent among many high-risk groups and this could increase the possibility of sexual transmission of this protozoan, mainly if it is considered the high number of asymptomatic cysts passers, the high cyst excretion rate and the long-term faecal shedding from infected human host, the immediate infectivity of cysts released in the faeces, and the low infectious dose necessary to initiate an infection (10 organisms) [7, 15].

From a public health perspective, the major challenge is how best to avoid acute infections in at-risk populations, and for those already infected, how to prevent consequent morbidity and transmission to other members in the community. A combination of both prevention and treatment is required to minimize the ongoing transmission of *Giardia* in the general population. For giardiasis, primary prevention is difficult, because a human vaccine is not available nor is one likely to be available in the near future. It seems necessary that providers have open and non-judgmental conversations with patients about the varying levels of risk for *Giardia* infection also based on sexual activity. Providers can intervene with education about harm reduction techniques; for instance, messages that include information that individuals with giardiasis are infectious during the cyst shedding. These patients should be counselled to avoid oral-anal contact during this time, and it should be explained that being asymptomatic, improvement of abdominal pain or the achievement of diarrhoea resolution do not unequivocally mean parasite clearance neither cessation of infectivity.

The present case series highlights some important points; firstly, the importance of considering the possibility of sexual transmission of *Giardia* infection in endemic countries, at least in those with recurrent *Giardia* infection or when other causes of treatment failures were ruled out, even among heterosexual couples: in this way the patient can be appropriately investigated and promptly - and properly - treated. Secondly, it is an important reminder that the human factor of compliance to therapy and preventive measures are at least as relevant, if not more so, than the drugs we choose for a regimen after failure of first-line therapy. Thirdly, the importance of tailoring messages according to the route and mode of transmission; patients could be receiving counselling messages sufficiently tailored to the epidemiological reality of the local endemicity regarding *Giardia* transmission that emphasize drinking unboiled water, eating contaminated food or swimming in contaminated pools, etc., forgetting other important modes of transmission that could be implicated.

While the importance of sexual transmission of *Giardia* infection in an endemic region need not to be overemphasized, its inadequate assessment makes re-infections possible. So, it is necessary to find an easy route into discussion about sexual transmission of this protozoan, avoiding moral judgments. Additionally, patients and their couples should be warned to use protection during this kind of sexual practice or abstain from it until a negative ova and parasites control after comple-

tion of a course of antigiardial drug was obtained. In the field of sexually transmitted infections (STIs), the effective management of these infections depends on appropriate testing, treatment, partner management, complete and timely reporting of positive the sexually transmitted disease tests and the implementation of preventive measures. However, in the case of *Giardia* infection, it is non-notifiable disease in many countries and it is not considered in the STIs setting, so the health department takes no action to notify partners. If sexual transmission is suspected, the responsibility mostly lies with the patient and most likely most physicians rely on the patient to notify his/her partner(s), which could persuade him/her to look for diagnosis and care, but probably not.

CONCLUSIONS

Although *Giardia* is mainly transmitted through contaminated water or food, and sexual transmission is not the primary route of transmission in endemic countries, the potential of sexual transmission of this protozoan should be ruled out, mainly in patients who actively report anilingus or those who report after questioning. Increased public awareness is essential for the treatment and control of this disease in different settings. People, in general, should be counselled accordingly with clear-designed messages about the relative contributions of the main modes of transmission of *Giardia*, so that they can make informed choices about the preventive measures they should take. As no immune protection can be expected from previous *Giardia* infections, infections may repeatedly occur, as long as high-risk practices or exposure to an ongoing source continue. Thus, considering *Giardia* in the STI setting, sexual partners should be screened for this protozoan infection and treated if necessary.

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Conflicts of interest
None declared.

Ethical approval
Not required; all patients were assessed, investigated and treated in accordance with standard clinical procedures in Cuba.

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