CASE REPORT


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ABSTRACT

Background

Dipylidiasis is a zoonotic disease caused by the cestode *Dipylidium caninum*. Human infection is transmitted by accidental ingestion of the dog or cat fleas or dog lice containing the infective stage. The infection is predominantly found in children where it causes mild abdominal pain and peri-anal itching.

Materials, Methods and Results

A 41-year-old Sudanese man came to Nyala hospital complaining of abdominal upset for about two months. He used many different medical prescriptions without improvement. His stool examination was reported as normal. He passed per rectum a chain of segmented worm. The worm was identified as *Dipylidium caninum*. After identification of the worm, examination of the patient’s stool showed the characteristic egg packets of *Dipylidium caninum*. Moreover, re-examinations of the preserved stool prior to worm expulsion which had been reported with unknown structures also showed egg packets. The patient was treated by praziquantel tablets for his infection and in a week time he became well and resumed his work. Two months later he came for follow up without any complaint and the results of his stool examination were normal.

Discussion and Conclusion
This is the first case to be reported in Sudan and we found in the literature only case report of human dipylidiasis in an adult woman. The vast majority of the reported cases worldwide were in children and infants. There are two important points that need to be highlighted; the first one is the importance of being aware of the risk of the pet animals as source of infection. The second point is the importance of the comprehensive training of the laboratory personnel in the field of parasitology.

**Keywords:** *Dipylidium caninum*, dipylidiasis, case report.

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**INTRODUCTION**

*Dipylidium caninum*, also called the cucumber tapeworm or the double-pored tapeworm, is a cyclophyllid cestode that causes dipylidiasis. It naturally infects animals afflicted with fleas, including canids, felids, and occasionally people who are in contact with pet animals, especially children. The intermediate hosts are the larval fleas of *Ctenocephalides canis*, *Ctenocephalides felis*, and *Pulex irritans* or a dog’s louse (*Trichodectes canis*). The natural host passes eggs in stool then they are ingested by the larval fleas which mature into infected adult fleas. The dog or cat bites the adult infected fleas on its skin and the larval forms of the tapeworm stick to its teeth and contaminate its saliva. A flea may contain multiple tapeworm larvae which are the infective stages and in such case an infection with many tapeworms is possible. The larvae grow in the small intestine and within 2–3 weeks they mature into adult tapeworms with a body measuring 15 cm–70 cm in length and 2 mm–3 mm in thickness. The distally located gravid segments are passed intact or disintegrate releasing eggs or egg packets in the host's faeces and the life cycle of the worm continues. The body of the adult worm is composed of a scolex with four suckers, a neck, and 60 to 175 proglottids. Each proglottid has two lateral genital pores. The gravid proglottids are located distally and each one contains egg packets with 3 to 30 eggs, mostly 8 to 15 with a diameter of 25–40 μm. Gravid proglottids look like pumpkin or cucumber seeds and they can migrate out of the anus or be passed in the stool. The egg packets spread over the host’s skin and the environment. The adult worm has a lifespan of approximately one year. Infants and young children are predominantly infected. The infections in humans occur when they ingest the infected fleas containing the infective stages of the worm accidentally or in contaminated food with the fleas directly or through food contaminated with dog’s or cat’s saliva. The worm completes its life cycle in human small intestine as in its natural hosts. Most of infections are asymptomatic, although mild diarrhoea, abdominal colic and rectal itching from the emerging proglottids can occur and rarely, allergic manifestations such as pruritus and skin rash.

Diagnosis of the infection is made by identification of rectally expelled proglottid(s) or by microscopic identification of egg packets in stool. Eggs arranged in packets are typical of dipylidiasis and stool specimens on several different days may be necessary for detection of egg packets.
The patient with dipylidiasis usually requires a single oral dose of praziquantel which kills the tapeworms within 24 hours. In heavy or persistent infections, a second oral dose can be administered\(^\text{10}\).

**OBJECTIVE**
The aim of this study was a case description of *Dipylidium caninum* infection in 41 year-old Sudanese man.

**Materials and Methods (Case Report)**
A 41-year-old male Sudanese civil engineer in road construction working between Nyala and Zalingi, Darfur, Sudan, came to Nyala hospital complaining of colicky abdominal pain, fullness of the epigastrium, bouts of nausea and vomiting for the last two months. The patient mentioned that he had received during his previous attacks many drugs mainly antispasmodics and antibiotics. In spite of these drugs there was no satisfactory improvement in his condition. He mentioned that in two occasions his abdominal symptoms became so severe that he intended to travel to Jordan for treatment but his treating physician advised him that his condition did not warrant such travelling. Lastly he felt lower abdominal colic and an urge to pass stool. He passed a chain of a segmented worm and it was brought immediately to Nyala Regional laboratory for identification. The worm was identified and sent to National Health Laboratory in Khartoum for confirmation.

The patient was examined physically and his blood, urine and several stool specimens were investigated. One of stool specimens was preserved after examination because the microscopic technologists said that they found structures that were not known to them. The expelled worm was identified and the patient was given the appropriate treatment and advised to come for follow up two months later.

**RESULTS**
On clinical examination the patient looked normal but there was mild tenderness in the hypogastrium, otherwise there were no eventful physical findings. The reports of examination of his complete blood count and urine were normal. Examination of several stool specimens was reported as normal prior to worm expulsion and identification. Macroscopic examination of the expelled segments showed whitish-grey chain of segments constituting part of a cestode about 6 cm long and 3 mm thick. Segments were of variable length and thickness, each one was oblong ranging between 10 mm and 15 mm in length and 2 mm and 3 mm in thickness. Microscopic examination of a segment showed two pores, one in the middle of each lateral margin and brown egg packets of *Dipylidium caninum*. Ten or more egg packets were observed in each segment containing mostly from two to three eggs. Meticulous examination of stool specimen collected after the worm was expelled and identified, showed several egg packets of *Dipylidium caninum*. 

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Moreover, examination of the preserved stool specimen with unidentified structures collected three days prior to worm expulsion showed the unknown structures to be egg packets of *Dipylidium caninum*. The microscopic technologists said that they detected the egg packets previously but did not know that these were due to a worm because they had not come across such structures during their training and practice. Two months later the patient came for follow up in a normal condition and examination of three stool specimens collected in consecutive days showed no egg packets.

**DISCUSSION**

By reviewing the published medical literature there was no other reported case of human dipylidiasis in Sudan. The worldwide reports of human dipylidiasis are very scarce. There were reports of *Dipylidium caninum* infection from USA\(^2\), Karimnagar (India)\(^4\), Poland\(^8\), Mexico\(^9\), and Sri Lanka,\(^11\) and all of them in children and infants. We came across only one report of a case of human dipylidiasis in a woman\(^12\). Since dogs and cats live in close proximity to humans, there are zoonotic parasites that can be transmitted to humans causing zoonoses. In most countries in the developing world, pet animals are commonly lacking veterinary care in addition to poor human environmental and personal hygiene. Such conditions lead to prevailing of so many zoonotic diseases. The transmission of dipylidiasis can be through direct contact with dogs and cats or their contaminated saliva when they bite the fleas on their skin. If a dog or a cat accidentally eats or drinks from human food or fluids or licks the utensil, it can contaminate these and they become source of infection. Children and infants are more prone to infection probably because they do not care much for what they ingest or introduce into their mouths. The patient in this study definitely ingested the flea that harbored the infective stage but how that happened was not clear. Whatever we reason for the mode of infection in this case they just remain postulations. The patient used to work in camp condition that might be accessible to stray or pet dogs or cats. The patients reported no ownership of pet dog or cat but he mentioned that sometimes he used to see such animals wondering about their tents. In spite of the scarcity of reports on human dipylidiasis in Sudan, we think it is not so rare but under diagnosed and under reported similar to many other infectious diseases. The favorable conditions for infection by this worm are all available in Sudan especially among the rural, nomadic and displaced communities. The probable source of infection in the present case could be the food contaminated with the infected dog or cat fleas. The patient might get milk from nomadic people around the camp where he was working. This milk could easily be contaminated from dogs or cats directly from their skin or saliva because nomadic people do not care much for the cleanliness and dogs and cats could easily access their fomites.
The most interesting event in this case was that the egg packets were frequently missed by the microscopic technologists prior to worm expulsion. This fact indicated that either the training in laboratory schools was inadequate or the worm was so rare that there was no specimen for training. In our opinion the first assumption is most likely. While we were students in Faculty of Medicine our teachers told us that in diagnosis of diseases; if one did not think of the disease he/she would not diagnose it. Here the microscopic technologists did not think of the possibility of finding such a worm and that was the reason of missing the egg packets in stool examination prior to worm expulsion and identification.

CONCLUSION

In spite of the scarcity of reports of human dipylidiasis, almost all the risk factors of the infection are available in Sudan and the rest of the developing countries. The most important measure that can be taken to control this disease is by eradication of the dog and cat fleas and dog lice. Although many of the infected humans remain asymptomatic, the event of concern is the morbidity that results in the paediatric age group which needs to be addressed. The clinical microbiologists and the paediatricians must recognize the significance of such parasitic infections that are transmitted from pets to humans. Comprehensive training of the medical laboratory personnel in the field of infectious diseases is needed in a country like Sudan where most of the patients’ complaints are due to infectious diseases.

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