

## *Hymenolepis nana* Human Diagnosed through Colonoscopy: A Case Report

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### Abstract

*Hymenolepis nana* infestation is commonly diagnosed in school-aged children and very rarely reported in adults patients in Saudi Arabia. We encountered an adult Saudi patient with a *H. nana* infection. The patient presented with a chronic history of vague abdominal pain and diarrhoea. He had negative laboratory examinations as well as a negative report on stool sample analysis. After misdiagnosis of his symptoms as Irritable Bowel Syndrome and failed treatment for Irritable Bowel Syndrome, he was readmitted to hospital. After thorough but negative physical, systemic and laboratory examinations, and stool sample microscopy, the patient underwent careful ileo-colonoscopy. He was found to have a *H. nana* infestation and after treatment with praziquantel, his symptoms were resolved. Our study supports the view that colonoscopy, with careful examination of intestinal mucosa, is a useful diagnostic approach for patients with parasitic infections and negative stool examinations.

**Keywords:** *Hymenolepis nana*; Colonoscopy; Parasitic infestation; Adult male patient

infection with *H. nana* diagnosed by colonoscopy in a Saudi adult male patient.

### Introduction

*Hymenolepis nana* is a cestode parasite commonly known as dwarf tapeworm. The diagnostic features of this family are: scolex armed with one cirlet of five hooks; one to three large testes and sacciform uterus.

The scolex is knob like in shape, has a rostellum with hooklets and four suckers. The segments are wider than they are long.

It is found throughout the world, more frequently in warm climate and temperate zones, commonly infects both rodents and human beings with school-aged children being more frequently infected. Light *H. nana* infections are usually asymptomatic, whereas heavy infections with more than 2,000 worms can induce a wide range of gastrointestinal symptoms and allergic responses including chronic urticaria, skin eruption, and phlyctenular keratoconjunctivitis [1], as well as abdominal pain and diarrhoea.

*H. nana* infection is more common around areas with low hygienic conditions where eggs can be passed through fecal matter from an infected host to an uninfected person. The parasite is 15 mm to 40 mm long and lives for up to 3 months in the human small intestine. Some of the eggs are expelled in the feces and cause autoinfection or infestation of other humans. Other eggs hatch in the villi of the small intestine and develop into cysticercoids and then into adult tape worms [2].

In Saudi Arabia, the infection is seen more often among expatriates and in Saudi children. The prevalence of infestation has been reported to be about 3% in school-aged children [3]. Infections in Saudi Arabia are infrequently seen among expatriates coming from Yemen, Sudan and Egypt. In Saudi adult patients however, it is rarely detected and represents only 0.1% of specimens collected compared to other parasites [4]. However, we recently encountered a rare case of heavy

### Case Presentation

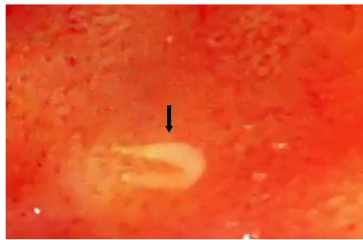
A 34 years old Saudi adult male patient visited the clinic complaining about vaguely localized abdominal pain. He was from Riyadh, located in the central part of Saudi Arabia. Its latitude is 24.774265, and the longitude is 46.738586. The patient's initial assessment reports showed normal laboratory and stool examinations. He was then referred to the Gastrointestinal (GI) clinic at King Saud Medical City. On taking a detailed history, it was found that he had suffering from diarrhoea, loss of appetite and non-specific abdominal pain for 7 years ago. The diarrhoea occurred 3-4 times per day, ranging from soft to watery stool not containing blood or undigested food. The diarrhoea sometimes occurred at night and was associated with abdominal pain in both the left and right lower abdominal quadrants. He had a history of frequent and irritable colic pain. There was no history of fever, GI bleeding or weight loss, and no extra-intestinal symptoms. He had no significant family history of a similar condition or a history of any allergic disorder.

He had travelled to the southern parts of Saudi Arabia in the last few years and he was investigated for his symptoms including stool analysis and colonoscopy. The tests were negative and he was misdiagnosed as suffering from Irritable Bowel Syndrome. He was treated for Irritable Bowel Syndrome but there was no significant improvement in his symptoms.

He was readmitted to hospital and again underwent a thorough examination. On physical examination he was of normal build. His vital signs were stable. On palpation, the abdomen was soft and relaxed, and the per-rectal examination was normal. Other system examinations were unremarkable. In laboratory examinations, the following parameters were measured; haemoglobin level 14 g/dL, platelets  $3.50 \times 10^5$  per  $\mu\text{m}^3$ , normal white blood cell count of  $7.8 \times 10^3$  per  $\text{mm}^3$  with eosinophils 7 per  $\text{mm}^3$ , creatinine 0.5 mg/dl, BUN 5

mg/dL, Na<sup>+</sup> 138 mmol/L, K<sup>+</sup> 4.2 mmol/L, ESR 8 mm/hour. Liver function tests were normal. A stool examination for ova, cysts and parasites was negative.

The patient underwent repeated ileo-colonoscopy with careful examination and surprisingly, tiny worms (4-5 mm in length) were detected. They were seen creeping and invading the villi of ileal mucosa (Figure 1). A washing sample of the ileal mucosa was sent to the parasitology laboratory where infestation with dwarf tape worms of *H. nana* with ova was detected. The patient was given praziquantel 25 mg/kg as a single dose. At a four week follow up, the patient's symptoms had subsided and his appetite had improved.



**Figure 1:** Ileal mucosa showing a *Hymenolepis nana* worm (black arrow) during ileo-colonoscopy.

A brief movie showing a *Hymenolepis nana* worm in the ileal mucosa during ileo-colonoscopy is shown in the supplemental file Worm.mov.

## Discussion

*Hymenolepis nana* is a small tapeworm (15-40 mm) that tends to infect children. Eggs of *H. nana* are immediately infective when passed with the stool and cannot survive more than 10 days in the external environment. When eggs are ingested by an intermediate host they develop into cysticercoids, which can infect humans or rodents upon ingestion and develop into adults in the ileal portion of the small intestine [2].

An alternate mode of infection consists of internal autoinfection, where the eggs release their hexacanth embryo, which penetrates the villus continuing the infective cycle without passage through the external environment. The life span of adult worms is 4 to 6 weeks, but internal autoinfection produces chronic infestation. It is one of a few parasites that can live for years in the GI tract [2]. Infection by *H. nana* is most often asymptomatic but symptoms such as abdominal pain, diarrhea, irritability, anal itching and weight loss do occur during a major infestation [5].

Proglottids of *H. nana* are rarely found in fecal samples because they do not ordinarily break off from the main strobili. Egg output could be sporadic so a couple of stool tests a few days apart may need to be carried out to diagnose the infection and rendering of ileo-colonoscopy is crucial for an unequivocal diagnosis [4,5].

Eosinophil counts are not diagnostically reliable. Eosinophilia is sporadically present and does not correlate with the severity of the infection. Eosinophil counts also do not help in monitoring treatment modalities [5].

Infections due to *H. nana* in adult patients are rarely seen. The transmission is considered to be due to travelling or migration from surrounding countries such as Yemen and Sudan [4-6].

The available literature about *H. nana* infestation in Saudi Arabia mainly concerns school-aged children and is rarely reported in adult patients. Various community-based studies have documented a range of prevalence values for intestinal parasitic infestations. The findings of this survey confirm the extremely complex nature of parasitic profiles in developing communities, and also indicate that relationships exist between cultural and ecological factors, sanitation and the observed patterns of intestinal parasites [7]. Muehlenbachs and collaborators have recently described malignant transformation of human tissue by abnormal proliferating, genetically altered tapeworm cells and he concluded that this was a novel disease mechanism that links infection and cancer.

Our case report has provided a rare example of an adult Saudi male patient who had an infestation of *H. nana*, with clinical features similar to Irritable Bowel Syndrome, who presented with negative results after blood and stool examinations. A careful colonoscopy examination can be very useful in the diagnosis of an atypical presentation of *H. nana* infestation. Our findings are consistent with other studies which reported that colonoscopy is a useful diagnostic approach for parasitic infections, even for asymptomatic patients, and for patients with negative stool examinations [8,9].

## Conclusions

In an adult patient complaining of abdominal symptoms and with normal routine laboratory and stool analysis, it is important not to exclude the presence of a parasitic infestation. *H. nana* infestation is most commonly diagnosed by stool analysis. But sometimes colonoscopy with careful examination of the ileal mucosa is crucial for the diagnosis of a *H. nana* infestation when other possibilities have been excluded. Adequate therapy is beneficial for helminthic infestations leading to significantly reduced morbidity and an improved quality of life.

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