

Case Report**Co-infection of *Sarcina* and *Giardia* in a child**Mahendra Kumar¹, Priyanka Bhagat¹, Amanjit Bal^{1,*} and Sadhna Lal²

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We present a case of 3-year-old boy who presented with vomiting and chronic diarrhoea, and the duodenal biopsy showed the presence of both *Giardia* and *Sarcina*. The clinical and pathological significance of *Sarcina* remains unknown in human beings and its co-existence with *Giardia* has not been reported.

INTRODUCTION

Sarcina is a gram-positive organism which occurs ubiquitously in the soil and air, and has been isolated from the human faeces [1]. The pathogenicity of *Sarcina* is questioned; however, its association with various gastric disorders like delayed gastric emptying and gastric outlet obstruction has been documented [2]. On the other hand, *Giardia* is an intestinal protozoan and a cosmopolitan parasite leading to diarrhoea, and its chronic infestation may lead to growth retardation in children [3, 4]. There is no report related to co-infection of these two organisms or their association with hepatitis A. Here we document a case of dual infection of *Sarcina* and *Giardia* in a patient of hepatitis A.

CASE REPORT

A 3-year-old boy presented with fever, jaundice and abdominal distension for 7 days. Physical examination revealed icterus, tender right hypochondrium and mild splenomegaly. Blood examination showed hyperbilirubinaemia (10.4 mg/dl), markedly raised serum alanine aminotransferase (1800 U/l) and moderately raised aspartate transaminase (600 U/l). Serological evaluation for viral hepatitis established the diagnosis of hepatitis A with raised serum anti-hepatitis A virus (anti-HAV) antibodies of IgM class. He was given supportive treatment and recovered in 6 weeks. One month later, the patient presented with diarrhoea which did not respond to antibiotic treatment. A clinical possibility of malabsorption was considered and a duodenal biopsy was done. Endoscopic

examination revealed normal gastric mucosa and mild grooving in D2 region of duodenum. The biopsy showed surface lining epithelium with the presence of organisms in tetrads and octads, conforming to the morphology of *Sarcina* (Fig. 1) along with trophozoites of *Giardia* (Fig. 2). Both the organisms were seen adhering to the mucosal surface. However, there was no ulceration or inflammation seen in the duodenal mucosa (Fig. 3).

DISCUSSION

Sarcina were first observed in the year 1842 by John Goodsir in the stomach contents of a patient with vomiting and gastric pain secondary to bloating [5]. This organism is 1.8–3 µm in diameter, nearly spherical cells and occurs in tetrads, octads or more. This characteristic configuration is the result of cell division in at least two planes of growth. The exact pathogenicity of *Sarcina* in human beings is not known; however, there have been a few reports of acute emphysematous gastritis, gastric ulcer and gastric perforation caused by this organism. These organisms have also been isolated from patients with pyloric stenosis as these are able to survive in the highly acidic environment of the stomach. In our patient, these seem to be bystanders only as they there was no ulceration or duodenitis in the biopsy.

Giardia intestinalis is one of the most prevalent enteroparasites found worldwide and frequently associated with diarrhoea, affecting all age groups. Clinical symptoms vary from asymptomatic to acute or chronic diarrhoea, dehydration,

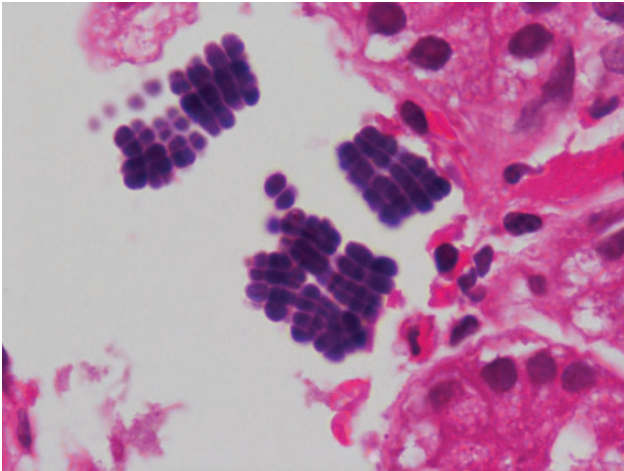


Figure 1: Photomicrograph showing *Sarcina* organism in the duodenal mucosa, with characteristic basophilic tetrad morphology (haematoxylin and eosin, $\times 400$).

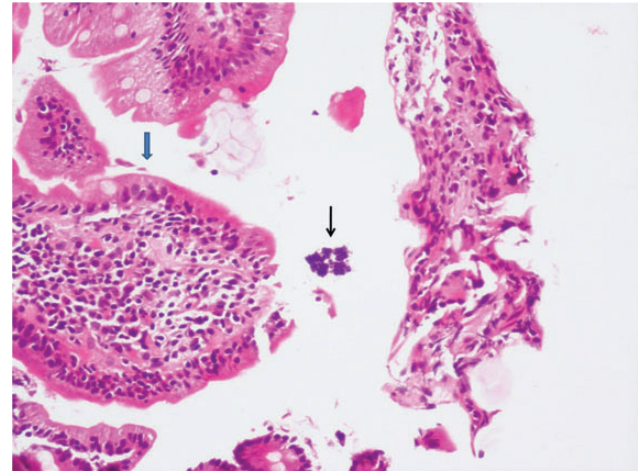


Figure 3: Photomicrograph showing both *Sarcina* (thin black arrow) and *Giardia* (thick blue arrow) in the duodenal biopsy, however no ulceration or inflammation is seen (haematoxylin and eosin, $\times 40$).

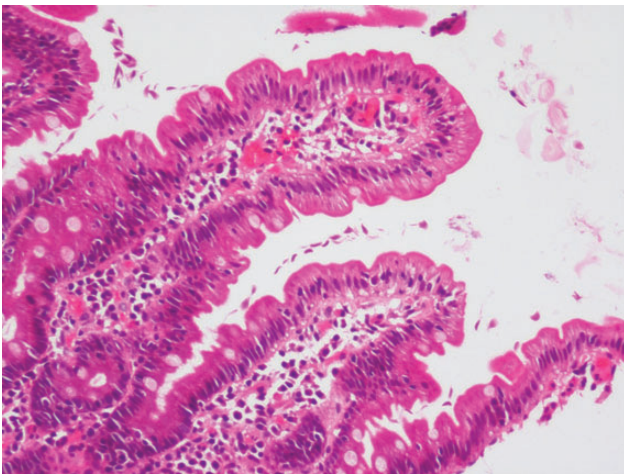


Figure 2: Photomicrograph showing *Giardia* in the duodenal mucosa (haematoxylin and eosin, $\times 200$).

abdominal pain and malabsorption [3, 4]. Infective stage is cyst and main mode of transmission is faeco-oral route. The risk factors of the *G. intestinalis* transmission include young age, poor personal hygiene, homosexuals, malnutrition, hypochlorhydria and acquired or congenital immunological deficiencies [6, 7].

Co-infection of these two organisms is not reported till date, not even their association with hepatitis A. Co-infection of *Giardia* and *Helicobacter pylori* are well documented; however, there is debate regarding which one increases the susceptibility for other [8, 9]. One study has demonstrated that *Giardia* infestation hampers the recovery of hepatitis B, but nothing has been documented with respect to hepatitis A [10]. One explanation for the association of *Giardia* with hepatitis

A may be poor hygiene, poor immunity and low socio-economic status as these are risk factors for both. The association of hepatitis A and *Giardia* with *Sarcina* is not well documented. In the present case, the patient did not have any signs or symptoms associated with *Sarcina*.

We are documenting this case due to rarity of *Sarcina* itself and its association with *Giardia* and hepatitis A. More cases are needed to establish their association with each other and to explore their synergistic or symbiotic relation if any.

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