

Short communication

Prospective evaluation of lactose malabsorption by lactose hydrogen breath test in individuals infected with *Entamoeba histolytica* and passing cysts

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The aim of the present prospective study was to detect lactose malabsorption in subjects in northern India infected with *Entamoeba histolytica* and passing cysts. The study group included forty-one patients with *E. histolytica* cysts in at least one of three consecutive faecal samples. Lactose malabsorption was detected by a lactose H₂ breath test. The results were compared with those of forty control subjects. Thirty-two of forty-one (78.0%) subjects passing *E. histolytica* cysts had lactose malabsorption compared with seventeen of forty (42.5%) control subjects ($P < 0.01$). In conclusion, the present study shows that lactose malabsorption is significantly more common in individuals infected with *E. histolytica* and passing cysts compared with control subjects.

Lactose malabsorption: *Entamoeba histolytica*: Hydrogen breath test

Infection with *Entamoeba histolytica* occurs worldwide (Gatti *et al.* 2001; Larrosa-Haro *et al.* 2002). In India, the incidence of *E. histolytica* ranges from 6 to 58% (Vakil *et al.* 1968; Shetty *et al.* 1990). Patients can present with infection in the intestine and liver, and occasionally in skin, lung and brain. Intestinal disease due to *E. histolytica* infection occurs both in adults and children (Nanda *et al.* 1984; Shetty *et al.* 1990). Infection can cause dysentery or non-dysenteric colonic disease, or patients may be in a non-invasive carrier state, i.e. asymptomatic cyst-passers. Patients can present with dysentery, diarrhoea, diarrhoea alternating with constipation, abdominal pain, a feeling of incomplete evacuation, anorexia, nausea, vomiting and flatulence (Krogstad *et al.* 1978; Knight, 1980).

Flatulence, abdominal pain and diarrhoea are common symptoms of lactose intolerance and of *E. histolytica* infection, but there is paucity of studies on lactose malabsorption in *E. histolytica* infection; therefore, the present prospective study was conducted to determine the frequency of lactose malabsorption in individuals infected with *E. histolytica* (and passing cysts).

Material and methods

This study was conducted on two groups of patients: the study group (forty-one individuals infected with

E. histolytica and passing cysts and the control group (forty patients with non-ulcer dyspepsia).

Patients in the study and control groups were examined in detail. A detailed history of gastrointestinal disturbances was taken, with special emphasis on the history of lactose intolerance, past or present history of dysentery, diarrhoea, constipation and flatulence, but their diet history was not determined. Proctosigmoidoscopy was done in patients in the study group.

The first samples of faeces in the morning were examined for three consecutive days for ova and cysts as a part of routine care in our hospital, as many parasites do not appear in faeces on a daily basis. Patients in the study group had at least one of the three samples of faeces positive for *E. histolytica* cysts. Patients were allocated to the control group only if examination of faeces was negative for ova and cysts for three consecutive days. Patients having concomitant illness, such as malignancy, tropical sprue, coeliac sprue or inflammatory bowel disease, were not included in the study. Lactose H₂ breath test was done according to the method of Newcomer *et al.* (1975).

Statistical significance was calculated using the χ^2 test.

Results

Forty-six individuals infected with *E. histolytica* (and passing cysts) were enrolled into the study group. Four

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patients were excluded from the study because two had concomitant abdominal tuberculosis and two had *Giardia lamblia* infection.

There were eighteen female and twenty-three male subjects in the study group (mean age 30.50 (SE 3.52) (range 21–50) years). There were sixteen female and twenty-four male subjects in the control group (mean age 31.50 (SE 4.33) (range 22–51) years). None of the patients in the study or control groups had a past or present history of dysentery and none of the patients in the study group had any abnormality of mucosa on proctosigmoidoscopy.

Twenty-three of the forty-one (56.1%) patients in the study group and twelve of the forty (30.0%) in the control group had a history of gaseousness and flatulence. Ten patients of forty-one (24.3%) in the study group had a history of intermittent diarrhoea, eight (19.5%) patients had a history of incomplete evacuation and eleven patients (26.8%) had a dull pain in the lower abdomen. Sixteen patients of forty-one (39%) in the study group and nine of the forty (22.5%) patients in the control group had a history suggestive of lactose intolerance.

In the study group, thirty-two of forty-one (78.0%) patients had an abnormal lactose H₂ breath test compared with seventeen of the forty (42.5%) control subjects. The difference in the results was statistically significant ($P < 0.01$). Twenty-five of the thirty-two (78.1%) lactose-malabsorbing patients in the study group and nine of the seventeen (52.9%) lactose-malabsorbing patients in the control group developed diarrhoea during the lactose H₂ breath test.

Discussion

The present study was conducted to detect lactose malabsorption in subjects infected with *E. histolytica* (and passing cysts) and in control subjects. Lactose malabsorption was significantly more evident in individuals infected with *E. histolytica* (and passing cysts). This suggests that subjects who malabsorb lactose are probably more prone to develop *E. histolytica* carrier-state. It is known that *E. histolytica* needs a glucose-rich environment to grow (Diamond, 1968). One can draw an analogy that in subjects who malabsorb lactose, malabsorbed lactose splits in the colon into glucose and galactose, thus providing a glucose-rich environment; this might act as one of the factors favouring the colonisation of *E. histolytica*.

However, to our knowledge there is no evidence from other research that subjects who malabsorb sugar and/or lactose are more prone to parasitic infection.

A second possibility is that infection with *E. histolytica* affects the integrity of the gut during passage, resulting into post-infective and/or post-dysenteric irritable bowel syndrome: lactose malabsorption is common among patients with irritable bowel syndrome (Quingley, 2003).

Ideally, we would have used healthy subjects as the control group, but it was not technically or ethically feasible to investigate healthy individuals to rule out *E. histolytica* infection and study lactose malabsorption.

In conclusion, the present study has shown that lactose malabsorption is significantly more common in individuals infected with *E. histolytica* and passing cysts than in control subjects.

References

- Diamond CS (1968) Techniques of axenic cultivation of *Entamoeba histolytica* Schaudinn 1903 and *E. histolytica* like amoebae. *J Parasitol* **54**, 1047–1056.
- Gatti S, Petithory JC, Ardoin F, *et al.* (2001) Asymptomatic amoebic infection: *Entamoeba histolytica* or *Entamoeba dispar*. That is the question. *Bull Soc Pathol Exot* **94**, 304–307.
- Knight R (1980) The chemotherapy of amoebiasis. *J Antimicrob Chemother* **6**, 577–579.
- Krogstad DJ, Spencer C Jr & Healy GR (1978) Current concepts in parasitology amoebiasis. *N Engl J Med* **298**, 262–265.
- Larrosa-Haro A, Ruiz-Perez M & Agular-Benavides S (2002) Utility of studying faeces for the diagnosis and management of infants and preschool children with diarrhea. *Salud Publica Mex* **44**, 328–334.
- Nanda R, Baweja V & Anand BS (1984) *Entamoeba histolytica* cyst passers: clinical features and outcome in untreated subjects. *Lancet* **2**, 301–303.
- Newcomer AD, McGill DB, Thomas PJ & Hofman AF (1975) Perspective comparison of indirect methods for detecting lactose deficiency. *N Engl J Med* **293**, 1232–1236.
- Quigley E (2003) Current concepts of the irritable bowel syndrome. *Scand J Gastroenterol* **237**, 1–8.
- Shetty N, Narasimha M, Raghuvveer TS, Elliott E, Farthing MJ & Macaden R (1990) Intestinal amoebiasis and giardiasis in southern Indian infants and children. *Trans R Soc Trop Med Hyg* **84**, 382–384.
- Vakil BJ, Metha AJ & Moses JM (1968) Intestinal amoebiasis: clinical manifestations. *J Assoc Phys Ind* **16**, 285–290.