The Incidence of Lactose Malabsorption in Ulcerative Colitis

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Since 1966, when Binder et al. (1) reported a 49 per cent incidence of lactose malabsorptiontion in patients with ulcerative colitis, increasing attention has been paid to the correlation between these two conditions. The incidences reported in subsequent studies have ranged from 8.5 to 49 per cent; the explanation for the different results could be considered to lie in the variation in the prevalence of lactose malabsorption in different races and ethnic groups.

The incidence of lactose malabsorption in the Danish population is presumably one of the lowest in the world, and a Danish population material must therefore be considered specially suitable for the elucidation of any coincidence or causal relationship between the two conditions. With this in mind we have investigated 120 consecutive patients admitted for ulcerative colitis with respect to lactose malabsorption.

MATERIAL

The material comprised 120 consecutive patients with ulcerative colitis who were admitted to our department of medical gastroenterology. There were 78 women and 42 men. The diagnosis of ulcerative colitis was based on the criteria that have been published previously (2), i.e. case history, sigmoidoscopic appearance, histological and/or cytological examination of the colon, and X-ray of the colon.

All the patients had at least a lactose tolerance test performed. If the lactose tolerance test was normal, the patients were considered to have normal digestion and absorption of lactose.

The diagnosis of, lactose malabsorption requires fulfilment of at least two of the following three criteria (9):

1) a flat blood glucose curve after ingestion of lactose, but a normal rise in blood glucose after ingestion of glucose and galactose;

2) abdominal discomfort and/or diarrhoea after ingestion of lactose;

3) no or subnormal lactase activity in a jejunal biopsy.

METHODS

Lactose tolerance test was performed as follows: after a night's fasting the patient was given 100 g lactose dissolved in 500 ml water to drink. Blood glucose levels in capillary blood were determined before and 15, 30, 45, 60, 90, and 120 minutes after the lactose administration. All evaluations were carried out in duplicate. By 'flat' lactose tolerance curve we imply

a rise in blood glucose of less than 25 mg per 100 ml (9). Analogous glucose-galactose tolerance tests were obtained with a mixture of 50 g of glucose and 50 g galactose being administered instead of lactose.

Jejunal biopsy was obtained at the level of Treitz's ligament by means of Rubin's 'multi-purpose suction biopsy tube'. One specimen was immediately frozen at -20 °C, and analysed for activity of lactase, sucrase, maltase, and alkaline phosphatase within 2 weeks (4).

The protein concentration was determined by Lowry's method (11). The enzymatic activity was expressed as international units per gram protein. A second biopsy specimen was immediately placed in formalin for subsequent histological examination.

Fig. 1. *Distribution of Patients with and without lactose malabsorption according to the severity of ulcerative colitis.*
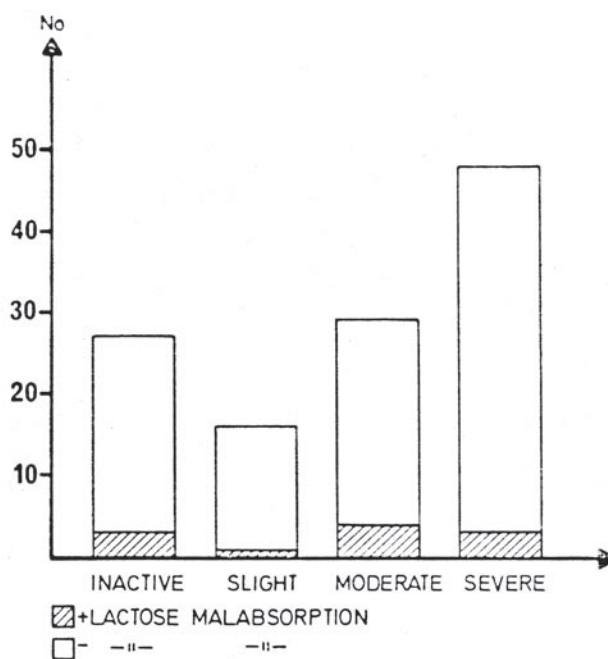
RESULTS

Eleven of the 120 patients included in the study were found to have lactose malabsorption in accordance with the criteria laid out above. The prevalence is thus 9.2 per cent (4.6-15.9 per cent with 95 per cent confidence limits). Six of the 11 patients were women, and five men. There was no significant difference in the incidence of lactose malabsorption in the two sexes.

The average age for the group with lactose malabsorption was 42 years, and that for the groups without was 38 years. Using Mann-Whitney's rank-sum

test for unpaired data it was found that there was no significant difference between these groups. The patients were divided according to the activity of their ulcerative colitis at the time of the lactose tolerance test following the previously published criteria (1). The distribution for the groups of patients with and without lactose malabsorption is apparent from Figure 1. There was no significant difference in the prevalence of patients with lactose malabsorption in the different stages of activity, as evaluated by Fisher's exact test.

Histological pictures of the jejunal biopsies were normal except for slight uncharacteristic changes.

DISCUSSION

The incidence of lactose malabsorption in ulcerative colitis has been found to vary considerably in different materials. Some authors have reported lactose malabsorption in almost half of their patients (l, 3), while others have not found lactose malabsorption to be more common than in a control material (10, 14). In the present material we have found an incidence of only about 9 per cent. This incidence is comparable with that reported in earlier Danish studies of patients with ulcerative colitis (10). As yet there have been no studies of the incidence of lactose malabsorption in the Danish normal population, but the incidence in a mixed Danish gastroenterological material has previously been reported as between 3 and 7 per cent (8), which is not significantly lower than that in the present material.

There may be a number of reasons for the wide differences in the incidence in the various reports.

A number of limited studies have shown that the lactase activity of the jejunal mucosa is reduced in acute exacerbations of ulcerative colitis (7). It is therefore possible that a transient lactose malabsorption may occur in the acute phase of the disorder. However, it is rare for the lactase activity to be reduced to levels which might cause lactose malabsorption and, in accordance with this, transient lactose malabsorption has only been demonstrated in a small number of cases (3, 10, 15). In our material the incidence of lactose malabsorption was not higher in patients with active than in those with inactive ulcerative colitis. It is therefore most improbable that differences in the activity of the disorder in the different materials could be the main cause of the difference in incidence.

Peña & Truelove (15) found that there was a higher incidence of persisting lactose malabsorption in the group of patients with the most active ulcerative colitis. As cause they postulated that patients with lactose malabsorption were for this reason more prone to suffer from acute attacks and therefore more commonly to be found in hospital materials. The present study has not confirmed this.

Lactose malabsorption is a common state which is found all over the world, but the incidence varies considerably between different races and ethnic groups. The lowest incidence, at the level of 3-7 per cent, has been found in whites in USA, England, and Denmark (8, 12, 13). In contrast to this there is an incidence of 70-100 per cent in most other races (6, 16) and ethnic groups, as for example Jews (5). Correspondingly, a higher incidence has been found in Jews with ulcerative colitis (17) - in contrast to the findings in our material.

The main cause of the high incidence in some reported materials is therefore undoubtedly that these have included patients of races in which lactose malabsorption is a common finding.

SUMMARY

BUSK, H. E., DAHLERUP, B., LYTZEN, T., BINDER. V. & GUDMAND-HÖYER, E.: The incidence of lactose malabsorption in ulcerative colitis. *Scand. J. Gastroent. 1975, 10, 263-265.*

120 Danish patients with ulcerative colitis, admitted consecutively to a Department of Gastroenterology, were investigated for lactose malabsorption. The prevalence was 9.2 per cent, which is not significantly higher than that in a mixed Danish gastroenterological material. There was no difference in distribution according to age and sex, and the incidence was not correlated to the severity of the ulcerative colitis. The possible reasons for the wide variation in the incidence of lactose malabsorption in materials of patients with ulcerative colitis are discussed, and it is concluded that the main cause must be that the materials with the highest incidences include patients of races and ethnic groups in which lactose malabsorption is a common finding.

Keywords: Colitis - ulcerative; lactose malabsorption - ethnic factors.

REFERENCES

1) Binder, H. J., Gryboski, J. D., Tahyer, W. R. & Spiro, H. M.
   Amer, J. dig. Dis. 1966, 11, 858-864.

2) Binder, V. Scand. J. Gastroent. 1970, 5, 627-632.

3) Cady A. B., Rhodes, J. B. Littman, A. & Crane, R. K. J.
   Lab. clin. Med. 1967, 70, 279¬-286.

4) Dahlqvist, A, Analyt. Biochem. 1968, 22, 99-107.

5) Gilat, T., Kuhn, R., Gelman, E. & Mizrahy, O.
   Amer. J. dig,   Dis. 1970, 15, 895-904.

6) Gudmand-Höyer, E. Thesis. pp. 26-27 in Specific Lactose
   Malabsorption in Adults. Thesis. FADL's Forlag, Copenhagen,
   Aarhus, Odense 1971.

7) Gudmand-Höyer, E., Binder, V. & Soltoft, J. Scand. J. Gastrent.
   1975, 10, 209-212.

8) Gudmand-Höyer, E., Dahlqvist, A. & Jarnum, S. Scand. J.
   Gastroent. 1969, 4, 377-386.

9) Gudmand-Höyer, E. & Jarnum, S. Gut 1969, 10,338-343.

10) Gudmand-Höyer, E. & Jarnum, S. Gut 1969, 10,338-343.

11) Lowry, O. H., Rosenbrough, N. J., Farr, A. L. & Randall, R. J.
    J. biol. Chem. 1951, 193, 265-275.

12) Neale, G. Proc. roy. Soc. Med. 1968, 61, 1099-1102.

13) Newcomer, A. D. & McGill, D, B. Gastroenterology 1967, 53,
    881-889.

14) Newcomer, A, D. & McGill, D. B. Gastroenterology 1967, 53,
    890-893.

15) Pena, A. S. & Truelove, S. C. Gastroenterology 1973,64,400-404.

16) Simoons, F. J. Dig. Dis. 1973, 18, 595-611.

17) Tandon, R., Mandell, H. Spiro, H. M. & Thayer, W. R., Jr.
    Amer. J. dig. Dis. 1971, 16, 845-848.