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Intestinal permeability tests and integrity of the small intestinal mucosa

Sir,

We read with interest the article by Nathavitharana et al.1 These workers have studied lactulose and mannitol intestinal permeability in 43 children with various degrees of intestinal mucosal damage, and compared the results with a control group of 53 children with histologically normal jejunal biopsy specimens. They showed that urinary mannitol:lactulose ratio was a sensitive test only for the detection of severe villous atrophy. Lesser degrees of mucosal damage could not be detected by this test.

We have developed and validated a sugar solution test in normal children and then used it to determine gut damage from chemotherapy in children with cancer. The sugar solution contains lactulose 5 g, mannitol 5 g, and 3-0-methyl-D-glucose 2 g, made up to 100 ml with water, which gives a measured osmolality of 696 mmol/kg. The dose given is 80 ml/m². The addition of 3-0-methyl-D-glucose to the standard intestinal permeability test also allows the measurement of active transport and may increase the sensitivity of the test in the detection of mucosal abnormalities. We have recently reported the preliminary results, which showed the test allows quantification of severity and timing of gut damage after chemotherapy.2 The sugars are accurately assayed by gas-liquid chromatography, the test is easy to perform and was well tolerated by normal children and children with cancer.

The osmolality of the test solution used by Nathavitharana and colleagues was 274 mmol/kg and differs from ours.

The Birmingham group recognised that the use of a more hypertonic solution might have improved the discrimination between damaged and normal mucosa.3 They suggested, however, that there was potential risk of inducing osmotic diarrhoea associated with the ingestion of hyperosmolar solutions in children. Our study has shown that children can tolerate relatively hyperosmolar oral solutions. Out of 49 normal children who performed the test, mild nausea was observed in two occasions and the passage of one loose stool was reported in two children.