be a process separate from absorption (Hendrix & Bayless, 1970), this interpretation is of some interest.

None of this invalidates the general conclusions reached by Dr Russell and his associates, including their important observation that clinical remission is not synonymous with functional improvement. It does point to the caution that must be used in comparing the results of perfusion studies which may differ significantly in details of technique—and perhaps for the need for perfusionists to reach some measure of agreement on standard experimental procedures.

References


Author's Reply

A study by perfusion techniques of the absorption abnormalities in the jejunum in adult coeliac disease

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Recalculation of the mean and SEM values for the water absorption in Table 1 of our recent paper (Russell, Allan, Gerskowitch & Robertson, 1972) confirms that the SEM of the coeliac disease group is ±10.0 and of the water absorption group ±21.1. Although it is statistically correct that the calculated means and SEM values for water absorption in the coeliac disease group do not differ significantly from zero, the absorption of sodium and chloride in the same group of patients does differ significantly from zero. The sodium values may, in fact, be of greater importance than those relating to water absorption. Each value in Table 1 is in itself a mean value derived from the absorption calculated in ten to twelve individual 10 min collection periods in a study in one patient. Thus a negative value for water absorption indicates net secretion over that period. The mean and SEM at the foot of each Table are the values derived from each patient's individual mean values. In three of the four patients reported with mean reduced absorption but not secretion, one or two negative values were obtained at some time during the study. These net secretion figures were obscured by the mean value for the study as a whole. Thus net secretion of water did occur at some time in thirteen of our fourteen patients with untreated coeliac disease. Our findings do appear to justify our statement that in untreated adult coeliac disease net entry of water may occur into the lumen of the small
Absorption abnormalities in coeliac disease

Intestine. Net entry of sodium and chloride also appears to occur. Even taking into account the four patients whose mean water absorption shows inhibition but not net secretion, there remains a highly statistically significant difference between the normal and the coeliac disease groups.

Dr Wingate seems to be concerned that all of our coeliac disease patients did not show net secretion of water, as was found in the group studied by Schmid, Phillips & Summerskill (1969), and he raises several interesting possibilities. I have already mentioned that three of our four patients with mean reduced absorption showed evidence of net secretion at some time during the perfusion study and it is possible that this may also have been found in the fourth patient if the study had been continued. Adult coeliac disease, in common with many other conditions, varies widely from patient to patient with respect to the degree of tissue damage, biochemical and clinical abnormalities (Mann, Brown & Kern, 1970). It is likely also that wide variations occur with respect to damage to the transport of water and electrolytes. Alterations with respect to time may also occur in the same patient. Thus variations in damage to the sodium pump mechanism in coeliac disease may lead in some instances to a reduced absorption and in others to a net secretion of electrolytes and water, depending on how well the pump can balance the constant loss of sodium into the lumen. The technique of intestinal perfusion can pick up only the end-result of this process, as it measures net flux across the mucosa. Reduced absorption or net secretion may thus only be matters of the degree of damage to the pump mechanism at any one time in any individual patient.

It would seem unlikely that the glucose concentration of 56 mmol/l, which we used in our study, would significantly reduce the net secretion of water and sodium in coeliac disease. Sladen & Dawson (1968), using an infusion rate of 20 ml/min, found no significant alteration of sodium secretion even with a glucose concentration of 84 mmol/l.

There has been much controversy as to the ideal technique for intestinal perfusion studies. The advantages of the triple-lumen tube system, incorporating a mixing segment, have been defined by Fordtran (1969). The use of a double-lumen tube with a proximal occluding balloon has been advocated by Phillips & Summerskill (1966). Recently, however, this system has been evaluated by Modigliani & Bernier (1971) who found that the absorption of water and glucose was significantly higher with the balloon deflated than inflated, due possibly to alteration of motility. Clearly disadvantages exist with all of the available methods. We have, however, found the triple-lumen method to give consistent results.

A universally accepted perfusion procedure would be very desirable, but there would be disadvantages. Although the perfusion technique is a well-validated method for studying intestinal absorption many of its uses call for differences in technique, either in the tube system itself or with respect to the composition of the perfusate. Differences in experimental procedures may therefore be unavoidable. Because of individual variations, the technique is probably of greatest value for the study of changes in intestinal absorption when the subject is used as his own control. There is, however, scope for further work to define the methods of perfusion most suitable for various types of absorption study.

References


Correspondence


