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## Serosal transfer of glucose during peristalsis

We have recently described a method (Gwee & Yeoh, 1968) for comparing the serosal appearance of a substance under “quiescent” and “peristaltic” conditions in the same piece of intestine. A solution of the substance is perfused through the lumen of the intestine at a constant pressure and peristaltic contractions may be initiated by causing the intestine to distend slightly. We now report the serosal transfer of glucose.

The salt solution used in the preliminary isolation and mounting of intestinal segments and also to bathe the serosal surface of the intestine (serosal fluid), contained only a minimal quantity of glucose (0.01 g/litre); the electrolyte composition (g/litre) was as follows: NaCl 6.92, KCl 0.353, CaCl<sub>2</sub> 0.282, MgSO<sub>4</sub> 0.142, KH<sub>2</sub>PO<sub>4</sub> 0.161, NaHCO<sub>3</sub> 1.0. The fluid used to perfuse the lumen (mucosal fluid) had the same electrolyte composition but the glucose concentration was increased to 3.6 g/litre.

After an initial rest period of 15 min and thereafter at 30 min intervals, the serosal fluid was sampled to determine the glucose concentration by the method of Nelson (1944). An experiment consisted of four 30 min periods of alternating quiescent and peristaltic conditions. Mean values for the change in serosal glucose concentration for 30 min periods gave the following results.

In 15 experiments the rate at which glucose appeared in the serosal fluid was  $56 \pm 5.1$  (s.e.)  $\mu\text{g}/\text{cm}$  intestine  $\text{h}^{-1}$  with the intestine quiescent and  $135 \pm 8.4$  with the intestine undergoing peristaltic contractions ( $P < 0.001$ ).

These results are consistent with the view that the serosal glucose is mainly transferred from the lumen and is not endogenous, since the rate of appearance of glucose on the serosal aspect varied with its concentration in the mucosal fluid, and the rate of appearance declined only slightly over the 2 h period of the experiments. Also, experiments with [<sup>14</sup>C] labelled glucose in guinea-pig small intestine showed similar “transfer” rates for glucose estimated chemically, and for glucose estimated by its radioactive content (Yeoh & Lee, 1968).

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December 10, 1968

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