A comparison of aspiration and scintigraphic techniques for measurement of gastric emptying rates of liquids in man

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The time course of gastric emptying of liquids can be measured by gastric aspiration methods, which require intubation, or by gamma scintigraphy, which is not invasive. We have compared results obtained with the two techniques. Seven fasted healthy male subjects consumed a liquid meal (8 ml/kg body weight) on two occasions one week apart. One drink (A) was an isotonic (296 mosmol/kg) carbohydrate (72 g/l) solution with added electrolytes, which is known to be emptied rapidly; drink B was a hypertonic (660 mosmol/kg) carbonated glucose polymer (360 g/l) solution, which was presumed to empty slowly. Scintigraphic measurements were made using an IGE Maxicamera linked to a Dec PDP II computer; drinks were labelled with 2 MBq $[^{99}Tc]$DTPA. Anterior and posterior abdominal scans were recorded alternately for 60 s for a total of 1 h; arithmetic mean counts of pairs of scans were used to calculate the volume emptied. Gastric aspiration was performed simultaneously by a modified double-sampling technique as described by Beckers et al. (1988) to determine total gastric contents and residual drink volume.

Data were analysed after semi-log transformation and emptying rates expressed as slope values. Mean (s.d.) slope values for drink A were $-0.021 (0.008)$ by gastric aspiration and $-0.016 (0.008)$ by scintigraphy. For drink B slope values were $-0.006 (0.0003)$ by gastric aspiration and $-0.004 (0.0001)$ by scintigraphy. Two-factor ANOVA revealed a highly significant difference in emptying rates between the two drinks ($P = 0.0001$), but no difference between the two techniques ($P = 0.117$). Regression analysis of the data showed a high degree of correlation between the two techniques ($r = 0.96$), confirming that comparable results are obtained with the different methods. The tendency for the scintigraphic technique to give slightly slower emptying rates may be explained by overlap of the stomach and the duodenal loop, scattering, attenuation correction and the choice of starting point.

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REFERENCE