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THE GASTRIC EMPTYING OF PELLETS IN SUPINE VOLUNTEERS

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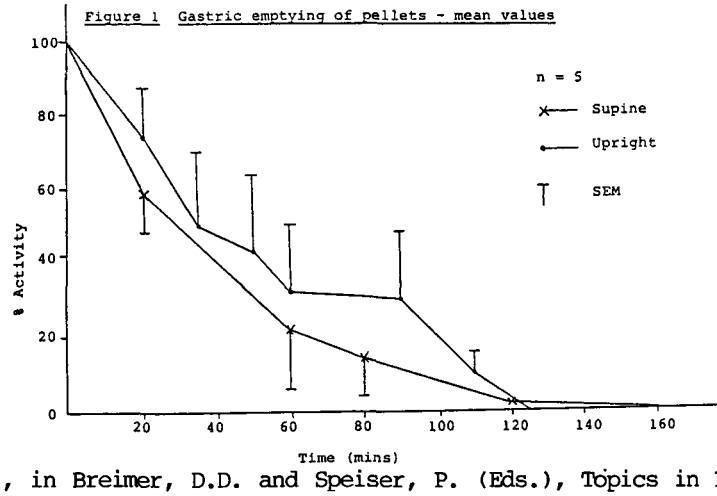
The gastric emptying of solid dosage forms, in humans, can be quantified using the non-invasive technique of gamma scintigraphy (Davis). Volunteers participating in such investigations usually remain upright during the period of study. In reality, however, oral preparations are often administered to patients confined to bed. It can be envisaged that the gastric emptying of the formulation could be influenced by the patient's posture. This study investigated the gastric emptying of pellets in fasted, supine healthy volunteers using the technique of gamma scintigraphy.

Pellets (0.5-1.0 mm, density 1.17 g/ml) of Amberlite IRA410 resin (BDH) were labelled by immersion in Tc-99m pertechnetate solution. The labelled pellets (310 mg) were packed into size 0 hard gelatin capsules (Capsugel). The capsules had a disintegration time of not more than 10 mins. The study involved five volunteers (age 18-25, height 1.7-2.0 m, weight 65-75 kg) who were not on medication, had abstained from alcohol for 24 hours, and had fasted overnight. The volunteers each swallowed one capsule (3 MBq) with 100 ml of water, and lay on stretcher trolleys for seven hours. Anterior and posterior images were taken at regular intervals using a General Electric Maxicamera, Type II, 40 cm field of view, fitted with a low energy (160 keV) parallel hole collimator, and linked to a Nodecrest computer. The images were analysed by drawing regions of interest around the position of the stomach, and correcting for background and decay. The geometric mean of corresponding anterior and posterior views was determined to correct for movement perpendicular to the plane of the camera. A control study was conducted seven days later, with the volunteers remaining upright.

The gastric emptying profiles for the supine and control studies are presented below (Figure 1). The pellets empty rapidly and in an exponential manner in both cases, with no marked difference between the t50% gastric emptying values (P>0.1). This rapid emptying of the pellets can be explained in terms of the contractions of the interdigestive myoelectric complex (IMC). The absence of food in the stomach may also explain the lack of a lag phase prior to emptying. These results suggest that posture does not influence the gastric emptying of pellets in fasted volunteers.

Figure 1 Gastric emptying of pellets - mean values



Davis, S.S., in Breimer, D.D. and Speiser, P. (Eds.), Topics in Pharmaceutical Sciences, 1983, Elsevier Biomedical, Amsterdam 1983, pp205-215.