

Letter

## The Effect of Density on the Gastric Emptying and Intestinal Transit of Solid Dosage Forms: Comments on the Article by Davis *et al.*

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KEY WORDS: gastric emptying; pellet density; gastrointestinal transit.

It was with interest that we read the article by Davis *et al.* (1). A study undertaken by Kaus *et al.* (2) shows similar results.

Davis *et al.* (1) found that pellets or single units of different densities given to healthy subjects did not show significant differences in gastric emptying. We studied nondisintegrating capsules of specific gravities 1.03 ( $\pm 0.02$ ) and 1.61 ( $\pm 0.02$ ), respectively, also using gamma scintigraphy. The time taken for the capsule to leave the stomach in fasting healthy subjects was not significantly different between the two specific gravities, using analysis of variance. Plots of the distance traveled down the first part of the small intestine against time showed that the slopes were not significantly different between the two specific gravities. The rate of travel in the small intestine was determined and a mean rate of 4.2 to 5.6 cm min<sup>-1</sup> was found, which reflects the velocity of migration of MMC along the intestine, found to be 4.7 ( $\pm 1.8$ ) cm min<sup>-1</sup> by Kerlin and Phillips (3). A further study by Kaus *et al.* (4), using metoclopramide to alter gas-

trointestinal mobility, showed that although the residence time compared to that of a control was not affected by metoclopramide, there was a significant increase in the rate of travel of the capsule in the first segment of the small intestine of healthy subjects.

Our initial studies have been confirmed by Davis *et al.* (1), who concluded that specific gravity cannot be considered as a means of influencing the gastric residence time of a solid dosage form.

### REFERENCES

1. S. S. Davis, A. F. Stockwell, M. J. Taylor, J. G. Hardy, *et al.* *Pharm. Res.* 3:208-213 (1986).
2. L. C. Kaus, J. T. Fell, H. Sharma, and D. C. Taylor. *Int. J. Pharm.* 20:315-323 (1984).
3. P. Kerlin and S. Phillips. *Gastroenterology* 82:694-700 (1982).
4. L. C. Kaus, J. T. Fell, H. Sharma, and D. C. Taylor. *Int. J. Pharm.* 22:99-103 (1984).

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