52P

RAFT STRENGTHS AND NEUTRALIZATION PROPERTIES OF ALGINATE ANTI-REFLUX AGENTS IN-VITRO

N. Washington, C. Washington, S. S. Davis and C. G. Wilson, Departments of Pharmacy and Physiology & Pharmacology, University of Nottingham, NG7 2RD UK

Proprietary variants of "Liquid Gaviscon" have been established in many countries following reformulation of the tablet preparation introduced by Ferring (Sweden). The prime indication for these materials is in the treatment of gastro-oesophageal reflux and opinions differ between two possible modes of action. It has been postulated that the preparation, which forms a floating neutral layer on reaction with gastric acid, may either inhibit reflux by a barrier action or be refluxed preferentially to the irritant gastric contents. The raft strength and neutralization profiles of four international "Liquid Gaviscon" formulations has been compared using the tests described by Washington et al., (1985, 1986) to establish the likely pharmacodynamic action of the preparations.
Rafts were formed by adding "Gaviscon" to 125 ml of 0.03M hydrochloric acid at 37^{o}C. Test volumes contained equal quantities of alginate. Neutralization/time profiles in the raft were measured using 10 ml samples of each formulation in a modified Rossett and Rice apparatus (Washington et al., 1985). The results are summarised in Table 1.

Table 1. Composition (mg/10ml) and Properties of the "Gaviscon" Formulations. (* indicates 5 ml sample used)

Manufacturer	Alginate	Na HCO3	Al OH3	Mg CO3	Ca CO3	Peak pH	Time>pH3 (min)	Raft Strength(g)
Reckitt & Colman (UK)	500	267	-	-	-	6.1	60	2.7*
Winthrop (Canada)	500	?	200	-	-	5.8	170	1.1*
Marion Labs (USA)	267	-	63	275	-	7	78	0.4
Ferring (Sweden)	500	170	1000	-	150	6.2	88	0.8*

None of the formulations tested neutralized acid below the raft. The presence of large amounts of aluminium hydroxide does not increase the neutralization time (e.g. Ferring formulation).
A significantly stronger raft was produced by the UK formulation. The presence of antacid materials in the other formulations produced weaker rafts and increased the time required for raft formation. The US formulation produced a very weak raft possibly due to the slow reaction of the insoluble magnesium carbonate with acid. It is hypothesised that formulations which form strong rafts may act primarily as physical barriers to reflux, whereas those which form weaker rafts may be refluxed preferentially to the gastric contents. However, there is little pharmacodynamic evidence to conclusively establish the mode of action in vivo.
The study highlights the differences in the properties of formulations bearing the same tradename.

Washington et al., (1985) Int. J. Pharm. 27: 279-286
Washington et al., (1986) Int. J. Pharm. 28: 139-143