ANTACID EFFICIENCY OF SOME COMMERCIALLY AVAILABLE ANTACID TABLETS

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Several evaluations of antacid formulations have been described (Fordtran et al 1973, Drake et al 1981). Where these evaluations have included tablet formulations the results are questionable because the apparent antacid efficiency is influenced by the degree of sub-division of the powdered tablets used. Tablets are recommended to be either sucked or chewed but preliminary investigation indicated that chewing produces particle size distributions which are so variable that antacid effect is completely unpredictable. Accordingly, a particle size fraction typical of the size distribution produced by sucking was used in this investigation.

4 groups of 10 volunteers sucked 2 randomly chosen tablet preparations for 5 min Particle size analysis (Coulter Counter) of the pooled saliva indicated that a 45-180μm sieve fraction of the powdered tablet should be used and this was added to a 0.5% w/v pepsin solution maintained at 37°C. The mixture was stirred at 60 rpm and 0.1M hydrochloric acid was added at intervals to lower the pH to 3 until the antacid failed to raise the pH above this level. The time (B) at which activity failed was regarded as the duration of action of the antacid and the total volume of acid (A) added at this time was taken as a measure of the neutralising capacity.

Previous methods of assessment have attributed antacid activity to the total volume of acid neutralised and give no recognition to the importance of duration of action in the management of gastro-intestinal ulceration. In order to combine the contributions of both the neutralising capacity and the duration of action, the area under the cumulative acid volume/time curve was determined and termed "antacid efficiency," (Table 1), shown as means of two determinations.

Table 1. A Comparison of Some Commercially Available Antacid Tablets.

Product	A(cm^3)	B(min)	Efficiency (min cm^3)	Product	A(cm^3)	B(min)	Efficiency (min cm^3)
Antasil	26.3	280	602	Nulacin	13.7	90	106
Andursil	29.0	226	370	Aludrox	15.9	112	106
Prodexin	28.6	158	347	Titralac	13.4	94	105
Altacite	23.8	211	295	Actal	10.4	138	99
Asilone	17.7	230	274	Droxalin	7.5	145	89
Dijex	16.7	218	224	Polycrol	8.1	132	79
Gastalar	15.1	97	142	Gelusil	7.2	102	70
Actonorm	16.4	97	130	Maalox	6.6	78	53
Polycrol Forte	10.2	164	127	Polyalk	4.7	143	44
Dioval Forte	9.2	190	124	Gaviscon	9.0	52	40
Dioval	13.7	112	118	Siloxyl	3.7	99	27

Neutralising capacity can generally be predicted from the formula: Antasil, containing twice as much aluminium and magnesium hydroxide as Dioval has twice the neutralising capacity. However, correct tablet formulation is also important since Maalox was inferior to Antasil, although both products contained the same amounts of antacid ingredients. Similarly, duration of action cannot be predicted simply by comparing the amounts of active ingredients.

In summary, a comparative assessment of commercial antacid tablets has been performed by simulating in-use conditions in a simple in vitro test which evaluates both neutralising capacity and the duration of antacid activity to produce an "antacid efficiency" index. It is suggested that the technique is conducive to adoption as a routine quality control procedure.

Fordtran, J.S. et al (1973) New England J. Med. 288 : 923-928
Drake, D. and Hollander, D. (1981) Ann. Int. Med. 94 : 215-217

0022-3573/81/120078P-01$02.50/0