International Journal of Pharmaceutics, 59 (1990) R1–R3
Elsevier

IJP 10009

Rapid Communication

Effect of sucralfate on procainamide absorption

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(Received 13 November 1989)
(Modified version received 29 January 1990)
(Accepted 31 January 1990)

Summary

The possible influence of coadministration of sucralfate on absorption of procainamide was assessed using salivary procainamide concentration. Four healthy volunteers participated in the study, in a randomized crossover fashion. Each subject was randomly assigned to receive either procainamide capsule alone (250 mg) or with sucralfate tablets (1 mg) ingested 1/2 h before procainamide. C_{max} was significantly decreased, but only by 5.3% when sucralfate was administered. There was no significant difference between the control and treatment studies for t_{max} and AUC.

Sucralfate is the aluminium salt of sucrose octa sulphate. It has been used clinically in the treatment of duodenal peptic-ulcer disease (Hollander, 1981).

Several studies have examined the influence of sucralfate coadministration on the absorption of other drugs. In rats, more than 50% decrease of indenolol absorption had been reported (Babhair and Tariq, 1984). The extent of bioavailability of sulpiride in humans was reduced by 40% when sucralfate was given concomitantly (Gouda et al., 1984). Warfarin administration failed to produce therapeutic prothrombin time in the presence of sucralfate in two separate cases (Mungall, 1983; Braverman and Marino, 1988). On the other hand, sucralfate did not affect paracetamol absorption in man (Kamali et al., 1985), or alter the total amount of furosemide excreted in the urine in rat (Hikal et al., 1987). Furthermore, it was reported that sucralfate had no significant effect on the bioavailability and elimination of ketoprofen, indomethacin or naproxen (Caille et al., 1987), and a single dose of sucralfate altered the rate neither nor extent of theophylline absorption to a clinically important extent (Cantral et al., 1988).

Procainamide is an anti-arrythmic compound which may be used for a prolonged period of time. The common side effects of this drug are gastrointestinal disturbances, nausea, vomiting and diarrhoea. Patients on procainamide therapy are likely to be medicated with sucralfate at one time or another. It has also been reported that the simultaneous occurrence of cardiac diseases and peptic ulcer is quite high (Lecker, 1978).

The present communication describes the results of studies on the interaction of sucralfate with procainamide. Four healthy male informed volunteers participated in a crossover study. The volunteers were instructed not to take any drug 1 week before and during the trial. The study was carried out under medical supervision. A wash-out period of 2 weeks ensured complete drug elimina-

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TABLE 1

Procainamide bioavailability from salivary concentration data

Subject	C_{max} (μg/ml)		Expt/control (×100)	t_{max} (h)		AUC (μg h ml^{-1})		Expt/control (×100)
	Expt	Control		Expt	Control	Expt	Control	
1	2.50	2.70	92.59	1	1	8.585	9.135	93.98
2	1.95	2.08	93.75	1.25	0.90	5.027	5.885	85.43
3	3.5	3.65	95.89	1.25	1.1	10.133	12.23	82.85
4	2.95	3.06	96.41	1.3	1	8.593	9.133	94.1
Mean	2.725	2.873	94.660	1.200	1	8.085	9.095	88.980
S.D.	0.659	0.658	1.796	0.135	0.082	2.164	2.590	5.964
C.V.%	24.18	22.90	1.90	11.280	8.17	26.77	28.48	6.70

Expt: One tablet (1 g) of sucralfate administered 1/2 h before 250 mg of procainamide hydrochloride. Control: A dose of 250 mg of procainamide hydrochloride.

tion before the next trial. All subjects abstained from food the night before their allocated treatment, and until 4 h after taking the medication. Smoking was not permitted during the study. The subjects were administered 250 mg of procainamide (capsules) orally in the control treatment, and in the experiment 1 g (one tablet) of sucralfate was ingested 1/2 h before the drug, then they were required to expectorate into a 10 ml stoppered test tube until about 3 ml of mixed saliva had been collected at several time intervals after administration. All samples were refrigerated until analysis using the protocol previously reported (Al-Shora et al., 1988).

Procainamide absorption was assessed by peak salivary concentration, C_{max}, time to peak, t_{max}, and area under the curve of saliva concentration-time, AUC. The salivary concentration of procainamide may be clinically more relevant than the corresponding plasma concentration (Danhof and Briemer, 1978). The data in Table I show a decrease in peak saliva procainamide concentration, C_{max}, of about 5.3% due to coadministration of sucralfate. This difference was found to be statistically significant (paired t-test, $p < 0.01$). However, this finding does not necessarily reflect a significant effect on bioavailability. It was also observed that the time to peak concentration, t_{max}, and the area under the curve, AUC, were decreased by about 20 and 11.2%, respectively. Statistical analysis of these two values showed no significant differences. The lack of significance may be due to the intersubject variability of these parameters observed in this and previous studies (Galeazzi et al., 1976).

The results of this study suggest that the concomitant adminstration of a single dose of sucralfate did not seem to significantly alter the absorption of procainamide in man. However, since the study was a single dose treatment and the subjects were healthy volunteers, these findings should be extrapolated with caution to situations in which patients are taking procainamide concurrently with sucralfate on a long-term basis.

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