Effect of Inorganic Cation on the Fecal-Hydrating Action of Dioctylsulfosuccinate in Rats

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The calcium and sodium salt forms of dioctylsulfosuccinate were tested in rats for ability to prevent dehydration of the feces. The drugs were equally potent on a weight basis indicating that potency was directly related to the diester content of the materials and independent of the inorganic cation.

SODIUM DIOCTYLSULFOSUCCINATE[1] is now widely used in medicine as a fecal-softening agent. Recently a calcium salt of dioctylsulfosuccinate was marketed for the same purpose. The calcium salt is claimed to be twice as active as the sodium salt. The effectiveness of the sodium salt as a fecal softener in rats and mice was described recently by Lish and Dungan (1). The objective of the present study was to determine the influence of the cation on the fecal-hydrating action of dioctylsulfosuccinate in rats.

METHOD

The test materials were compared for ability to produce fecal-hydration following oral administration to rats. The technique used was adapted from Miller (2) with modifications essentially as described previously by Lish and Dungan (1). Minor deviations from the latter description were the use of ten animals per dosage level and restriction of observation periods to the 1, 2, and 4-hour intervals, post administration of the test agent. Rats were designated *positive* or *negative* responders depending on whether the water content of the dropped stools was sufficiently high to stain the absorbent paper on which they fell. The method of Litchfield and Wilcoxon (3) was used to evaluate the all or none type data.

Sodium content of sodium dioctylsulfosuccinate ($C_{20}H_{37}O_7SNa$; formula wt. 444.6) was 5.1%. Calcium content of calcium dioctylsulfosuccinate ($C_{20}H_{37}O_7S$ 1/2Ca; formula wt. 441.6) was 4.5%. All dosages were expressed as weight of the salt.

RESULTS

Results are shown in Table I. Data obtained at the 4-hour period post-drug dosage are presented graphically in Fig. 1. Dosages responsible for wet feces in 50% of the rats (ED_{50}) were 123.9 mg./Kg., and 110.8 mg./Kg., for the sodium and calcium salts, respectively. Statistical treatment revealed no significant difference in potency.

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[1] Marketed as Colace by Mead Johnson and Co., Evansville, Ind.

TABLE I.—EFFECT OF TWO SALT FORMS OF DIOCTYLSULFOSUCCINATE ON THE WATER CONTENT OF RAT FECES

Test Material		Positive Response/ Total Rats, Post-Drug Administration, hr.		
Name	P.O. Dosage, mg./Kg.	1	2	4
Sodium dioctyl-sulfosuccinate	70	0/10	0/10	1/10
	100	0/10	0/10	3/10
	150	6/10	7/10	8/10
	225	8/10	8/10	8/10
Calcium dioctyl-sulfosuccinate	70	1/10	1/10	2/10
	100	1/10	2/10	6/10
	150	4/10	6/10	6/10
	225	5/10	7/10	8/10

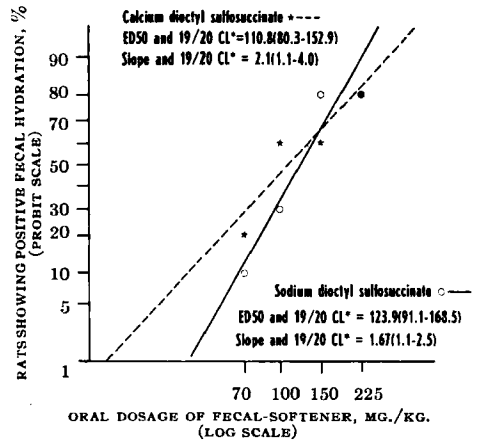

Fig. 1.—Log dose–probit relationships of the fecal-hydrating action of two salt forms of dioctylsulfosuccinate in the rat. Slope values, ED_{50} values, and $^{19}/_{20}$ confidence limits (C.L.*) according to Litchfield and Wilcoxon (3).

REFERENCES

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