

Reaction of *Vibrio cholerae* and Choleraenic Toxin in Ileal Loop of Laboratory Animals

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Accumulation of fluid in the ligated ileal loop upon injection of cholera vibrios or choleraenic toxin seems to be a generalized phenomenon in laboratory animals.

This note reports a comparative study of mice, rats, gerbils, hamsters, guinea pigs, chinchillas, and cats in respect to response of the ligated ileal loop to vibrios and to choleraenic toxin. Ten strains (five *Vibrio cholerae* and five *V. eltor*) of homologously passed vibrios were used, including the nonpathogenic El Tor water 6 (5) and pathogenic *V. cholerae* Inaba strain 569B. The experimental inocula were log-phase vibrios grown in 2% peptone (Difco) at 37 C for 4 hr. The crude choleraenic toxin was prepared by growing strain 569B in alkaline peptone water by the method of Coleman et al. (2). The toxin was titrated in rabbit loops by the method of Kasai and Burrows (4). The animals received no food for 24 hr prior to and after experimental inoculation by the procedure of De and Chatterje (3). They were sacrificed and examined 16 hr later.

Excepting Swiss mice, readily reproducible results were obtained with all animals. All showed gross accumulation of fluid after injection of either pathogenic vibrios (Table 1) or toxin (Table 2). The results obtained with strain 569B are representative (Table 1). With mice, there was consistent evidence that the vibrios replicated in the gut, but there was little or no accumulation of fluid accompanying this growth. There was no accumulation of fluid in any of these animals after injection of 1×10^{10} cells of live nonpathogenic or heat-killed (100 C, 10 min) pathogenic vibrios.

Gross accumulation of fluid in ileal loops of rats has also been reported by Aziz et al. (1), and Pal et al. (6) observed this with chickens. Heckly and Wolochow recently reported (Bacteriol. Proc., p. 89, 1969) accumulation of fluid in ileal loops of miniature pigs upon injection of cholera toxin, and that this animal was appreciably less sensitive than the well known and standardized rabbit model. We therefore conclude (1) that this reaction to vibrios and to cholera toxin may

TABLE 1. Ileal loop reactions of laboratory animals to *V. cholerae* 569B

Animal	Dose	Fluid (ml/cm) ^a		Vibrios per ml
		Experimental	Control	
Gerbil	1×10^5	0.25 ^b	<0.05	6×10^8
Rat	1×10^6	0.30	<0.05	6×10^8
Hamster	1×10^6	0.40	<0.05	8×10^8
Guinea pig	1×10^6	0.50	<0.05	8×10^8
Chinchilla	1×10^6	0.70	<0.05	8×10^8
Cat	1×10^7	1.30	0.05	7×10^8
Mouse	5×10^7	0.10	<0.05	6×10^8

^a Each loop was approximately 10 cm and was near the caecal end of the ileum.

^b Each figure is the average from three loops in three animals.

TABLE 2. Reaction of ileal loop to crude choleraenic toxin

Animal	Dose (loop units)	Fluid (ml/cm)	
		Experimental	Control
Gerbil	0.25	0.20	<0.05
Rat	0.50	0.30	<0.05
Hamster	0.50	0.30	<0.05
Guinea pig	0.50	0.45	<0.05
Chinchilla	0.50	0.80	<0.05
Cat	5	1.50	0.05
Mouse	5	0.10	<0.05

be a generalized property of the vertebrate ileum, and, therefore (2), if this be true, ileal loops of animals other than the adult rabbit are neither basically new nor convincingly better models.

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