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Comparative Value of "Gastric Mucin" and "Alkalies" in Prevention of "Peptic" Ulcer in Biliary Fistula Dogs.

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Fogelson[1] and Atkinson[2] have observed clinically that the administration of "gastric mucin" to gastro-duodenal ulcer patients was followed by a relief of the ulcer symptoms and an increase of body weight. Kim and Ivy[3] found that one ounce of "gastric mucin" a day prevented the occurrence of duodenal ulcer in biliary fistula dogs, in which the incidence of duodenal ulcer is from 40%[4] to 60%,[5] and that the animals on "gastric mucin" maintained their body weight much better than the control dogs not receiving mucin. It is well known that the administration of alkaline powders is of benefit in the management of patients with gastro-duodenal ulcer. We desired to ascertain if the administration of alkaline powders would have the same effect as "gastric mucin" in preventing the occurrence of duodenal ulcers and in maintaining body weight in biliary fistula dogs.

Ten healthy dogs were used in each series. The biliary fistula was made according to the method of Rous and McMaster.[6] All the animals were kept in single cages and were fed a stock diet of cooked yellow corn meal, bone soup and bread with mucin or alkali twice a day. The dose of "mucin" was 15 gm. with each meal. The dose of alkaline powder consisted of 1 gm. each of sodium bicarbonate and calcium carbonate with each meal. This dose of alkali was used because it has a slightly greater "buffering action" than 15 gm. of the "mucin" used in these experiments. All of the animals showed an absence of bile in the feces during life and in the stomach and duodenal contents immediately after being sacrificed. They secreted daily from 5 to 15 cc. of bile per kilo body weight, which is "normal" for biliary fistula dogs.[3] All were sacrificed at the time indicated in the table, the "alkali" dogs being sacrificed

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1 Fogelson, *J. Am. Med. Assn.*, 1931, **96**, 637.

2 Atkinson, *J. Am. Med. Assn.*, in press.

3 Kim and Ivy, *J. Am. Med. Assn.*, 1931, **97**, 1511.

4 Kapsinow, *Ann. Surg.*, 1926, **83**, 614.

5 Berg and Jobling, *Arch. Surg.*, 1930, **20**, 997.

6 Rous and McMaster, *J. Exp. Med.*, 1923, **37**, 11.

TABLE I.

Comparison of the Effect of "Gastric Mucin" and "Alkalies" on Biliary Fistula Dogs.

No. of Dog	Length of Experiment—Days	Appetite and General Condition	Gastro-duodenal Ulcer	Loss of Weight %	Remarks
			With Mucin		
1	70	Very good	None	15	
2	49	Fair	"	25	
3	32	Good	"	22	
4	37	"	"	20	
5	116	Very good	"	15	
6	96	" "	"	15	
7	49	" "	"	15	
8	113	" "	"	12	
9	62	" "	"	15	
10	44	" "	"	18	
Average				17.4	
			With Alkalies		
1	31	Fair	None	33	
2	32	Good	"	33	
3	31	Very poor	"	56	Trophic ulcer on back Corneal ulcer. Bloody stool
4	31	Good	"	27	
5	32	Very poor	"	43	Autopsy shows gastroduodenitis
6	47	" "	"	56	Trophic ulcer on back Bloody stool
7	43	Poor	"	32	Trophic ulcer on legs
8	80	Very good	"	15	
9	63	Poor	"	42	Trophic ulcer on legs
10	50	Good	"	25	
Average				36.2	

earlier on the average because of the marked loss of weight. The period of observation was not too short in this experiment because the duodenal ulcer may develop in biliary fistula dogs in from 12 to 16 days after operation when fed only the stock diet.[3, 5]

A gastric analysis was performed 4 hours after the ingestion of the meal with mucin or the "alkalies". The average acidity in the "mucin dogs" was 8 units free and 80 total; in the "alkali dogs" the acidity was 0 units free and 35 total; on the "stock diet" without "mucin" or "alkali" the acidity was 27 units free and 75 total.

It was found that none of the dogs developed ulcers; but the dogs on "gastric mucin" did much better in regard to appetite, general condition and maintenance of body weight than the dogs on alkaline powders.