THE CHEMOTHERAPY OF INFANTILE DIARRHEA: A COMPARISON OF SULFATHIAZOLE AND SULFAGUANIDINE

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BECAUSE of the conflicting reports of the efficacy of sulfathiazole[1] and sulfaguanidine[2] in the treatment of infantile diarrhea, thirty-one infants admitted to Duke Hospital during the summer of 1941 with diarrhea were given sulfonamide therapy in addition to the routine basic treatment.* Sixteen of these patients were treated with sulfathiazole and fifteen with sulfaguanidine from the day of admission to the fourth or fifth day after their diarrhea and all symptoms and signs of infection, if present, had ceased (Table I). The infants under

TABLE I

TOTAL PATIENTS TREATED ACCORDING TO TYPE OF DIARRHEA

	TOTAL NUMBER OF PATIENTS	TREATED WITH SULFATHIAZOLE		TREATED WITH SULFAGUANIDINE	
		NUMBER OF PATIENTS	AVERAGE DAYS TO CURE	NUMBER OF PATIENTS	AVERAGE DAYS TO CURE
Parenteral diarrhea	15	8	4.7	7	3.8
Bacillary dysentery	16	8	4.4	8	3.8

1 year of age in the sulfathiazole group received 1 Gm. (gr. xv) on admission and 0.25 Gm. (gr. iv) q.4 h., and those in the sulfaguanidine series were given 2 Gm. (gr. xxx) on admission and 0.5 Gm. (gr. viiss) q.4 h. The doses of each of these drugs were doubled for infants over the age of 1 year. The only toxic reactions were in two patients whose fever was apparently prolonged by sulfathiazole; their temperatures became normal when the drug was stopped.

Clinically sixteen of the thirty-one infants had bacillary dysentery and fifteen had parenteral diarrhea; i.e., they had infection elsewhere, usually upper respiratory infections (Tables II and III). However, no

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*The routine basic treatment which all diarrhea patients received was: (1) one-sixth molar sodium lactate as indicated by the admission CO_2 combining power, one-half the dose being given intravenously and one-half subcutaneously; (2) nothing by mouth for the first 24 hours except Ringer's solution and weak tea as desired; (3) after twenty-four hours equal parts of evaporated milk and water with 0.75 per cent lactic acid and 5 per cent Casec was offered in amounts furnishing 20 calories per kilogram of body weight, and if this was taken, the quantity was increased by 20 calories per kilogram every second day until the caloric requirements were attained; (4) 5 per cent dextrose intravenously and other parenteral fluids as indicated by the degree of dehydration up to 30 c.c. per kilogram of body weight in 24 hours; (5) blood transfusions following hydration, if indicated; (6) daily maintenance oral doses of thiamin chloride and ascorbic acid.

TABLE II

SIXTEEN PATIENTS TREATED WITH SULFATHIAZOLE

SEX	RACE	AGE (MO.)	CLINICAL DIAGNOSIS	DAILY NUMBER OF STOOLS PRIOR TO ADMISSION	DEGREE OF DEHYDRATION	SULFATHIAZOLE (GM.)			DAYS UNTIL CURE
						ADMISSION DOSE	Q.4 H. DOSE	TOTAL DOSE	
F	C	5	Dys.	6 to 8 (1 week)	Marked	0.3	0.1	3.3	4
F	W	3	Dys.	Many (4 days)	Marked	0.1	0.1	3.1	4
F	C	24	P.D.	Many	Marked	1.0	0.3	13.6	3
M	W	14	P.D.	15 to 20 (24 hours)	Marked	1.0	1.25	13.0	3
M	W	22	P.D.	12 (1 week)	Marked	2.0	0.3	9.2	3
F	W	9	P.D.	6 to 7	Marked	1.0	0.2	5.8	4
F	C	5	P.D.	Unknown	Marked	0.15	0.15	7.2	7
F	C	1.5	Dys.	6 to 7	Marked	0.15	0.15	5.4	6
F	C	5	P.D.	Unknown	Marked	0.15	0.15	7.2	11
M	W	8	Dys.	7 to 10	Marked	0.5	0.15	7.7	4
M	W	8	Dys.	20	Marked	0.5	0.15	5.0	4
F	W	18	P.D.	5 (24 hours)	Moderate	1.5	0.25	7.5	2
M	W	3	Dys.	7 to 10 (1 week)	Moderate	0.25	0.1	2.05	4
M	C	2	Dys.	12 (2 mo.)	Slight	0.3	0.1	2.1	5
M	W	2	P.D.	8 to 9	Slight	0.5	0.1	3.5	3
M	W	9	Dys.	4 to 5 (4 weeks)	Slight	0.5	0.25	9.5	4

TABLE III

FIFTEEN PATIENTS TREATED WITH SULFAGUANIDINE

SEX	RACE	AGE (MO.)	CLINICAL DIAGNOSIS	DAILY NUMBER OF STOOLS PRIOR TO ADMISSION	DEGREE OF DEHYDRATION	SULFAGUANIDINE (GM.)			DAYS UNTIL CURE
						ADMISSION DOSE	Q.4 H. DOSE	TOTAL DOSE	
M	W	2.5	Dys.	10 to 12 (4 days)	Marked	1.0	0.25	7.0	3
F	C	13	Dys.	10 to 15 (5 days)	Marked	1.0	0.3	17.2	4
F	W	2	P.D.	Unknown	Marked	1.0	0.3	13.6	6
M	W	8	Dys.	20	Marked	1.0	0.3	10.0	5
M	C	5	Dys.	5 to 6 (2 weeks)	Marked	0.2	0.2	7.4	6
F	C	2.25	Dys.	6 to 7 (2 days)	Marked	0.4	0.15	4.9	2
M*	C	4	P.D.	16 (4 days)	Marked	0.4	0.2	2.8	7
M†	C	2.5	Dys.	25 (24 hours)	Marked	0.2	0.2	3.8	5
M‡	W	5	P.D.	Many (2 weeks)	Marked	1.0	0.3	10.0	6
M	W	9	Dys.	Many	Moderate	1.0	0.5	34.0	3
F	W	16	P.D.	Many	Moderate	2.0	0.3	11.0	4
F	C	24	P.D.	8 to 9	Moderate	2.0	0.7	31.4	3
M	W	4	Dys.	4 to 5 (1 week)	Moderate	0.5	0.25	12.5	4
M	W	8	P.D.	8 to 15 (3 weeks)	Slight	1.0	0.25	10.0	3
F	C	24	P.D.	Many	Slight	2.5	0.8	16.9	3

*This patient also received 4.8 grams of sulfathiazole.
†This patient also received 3.1 grams of sulfathiazole.
‡This patient also received 6.45 grams of sulfathiazole.

pathogenic bacteria were isolated from the stools of either group, although they were cultured daily for three days after admission.

Eight of the bacillary dysentery group were given sulfathiazole and eight received sulfaguanidine. Of the patients who received sulfaguanidine, one who was not improving was later given sulfathiazole with marked benefit. Of the parenteral diarrhea series, eight were treated with sulfathiazole and seven received sulfaguanidine. Of the patients receiving sulfaguanidine, two who showed no improvement were changed to sulfathiazole and immediately improved. As shown in Table I, except for the three infants who did not improve on sulfaguanidine, the two drugs were equally effective in both the dysentery and parenteral diarrhea cases.

TABLE IV

DISTRIBUTION OF PATIENTS ACCORDING TO DEGREE OF DEHYDRATION

DEHYDRATION	TREATED WITH SULFATHIAZOLE		TREATED WITH SULFAGUANIDINE	
	NUMBER OF PATIENTS	AVERAGE DAYS TO CURE	NUMBER OF PATIENTS	AVERAGE DAYS TO CURE
Marked	11	4.8	9	4.8
Moderate	2	3.0	4	3.5
Slight	3	4.3	2	3.0
Results	16	4.44	15	4.26

TABLE V

PATIENTS WITH TYPHOID AND PARATYPHOID TREATED WITH SULFATHIAZOLE AND SULFAGUANIDINE

SEX	RACE	AGE (MO.)	CLINICAL DIAGNOSIS	NUMBER OF STOOLS PRIOR TO ADMISSION	DEGREE OF DEHYDRATION	SULFONAMIDE (GM.)			DAYS UNTIL CURE
						ADMISSION DOSE	Q.4 H. DOSE	TOTAL DOSE	
F*	W	3	Typhoid	16 (4 days)	Marked	0.5	0.15	7.3	7
F*	W	7	Paratyphoid	Many	Marked	0.3	0.1	4.8	3
M†	W	0.5	Paratyphoid	7 to 8 (2 weeks)	Marked	0.5	0.25	17.25	3
M†	C	4	Paratyphoid	Many (20 hours)	Moderate	2.0	0.25	19.0	4

*These patients received sulfathiazole.
†These patients received sulfaguanidine.

When the cases are analyzed according to the degree of dehydration (Table IV), sulfathiazole and sulfaguanidine were equally effective in all three groups.

In addition to these thirty-one cases of diarrhea treated with sulfonamide drugs, four patients were admitted with histories of severe diarrhea and died in collapse within a few hours of admission. They are not included in this series because they did not live long enough to be given sulfonamide therapy.

One case of typhoid fever and one of paratyphoid A were treated with sulfathiazole, and two paratyphoid A patients received sulfaguanidine (Table V). The sulfonamides seemed to have been beneficial in checking the diarrhea.

CONCLUSION

Both sulfathiazole and sulfaguanidine, in the doses used, were equally effective in the treatment of infantile diarrhea of the clinical bacillary dysentery and parenteral diarrhea types.

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