BACILLARY DYSENTERY IN AFRICAN CHILDREN ON THE WITWATERSRAND

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'It has .... been shown in the United States and elsewhere that when cases of "diarrhoea, enteritis and dysentery" are carefully studied, the majority appear to be bacillary dysentery.'[1]

The investigation to be described was carried out to ascertain the importance of bacillary dysentery in the causation of diarrhoeal disorders among African children in the Johannesburg area. It was found that dysentery organisms were present in less than 20% of these patients.

Material and Methods

The survey was carried out at the out-patients department of the Baragwanath Hospital on 200 African children suffering from diarrhoea. Half the cases were investigated during winter and the remaining 100 cases during the middle of summer. There was no selection of cases and the age distribution was as shown in Table I.

TABLE I. PATIENTS IN WINTER AND SUMMER SERIES DIVIDED INTO AGE-GROUPS

Age of Patient	*Winter*	*Summer*
Birth to 6 months	8	17
Over 6 months to 1 year	34	24
Over 1 year to 2 years	39	50
Over 2 years to 9 years	19	9

A group of 50 children of comparable age with complaints other than diarrhoea served as controls. All control specimens were taken in summer. Only one specimen was examined from each patient and each control subject.

Specimens were obtained for bacteriological examination by means of 'throat' swabs which were introduced as high as possible into the rectum and rubbed over the mucosa. All swabbings were carried out by the same person (E.K.) and specimens reached the laboratory within 1 hour of collection.

On arrival at the laboratory each swab was agitated first in a tube containing 10 ml. normal saline and then in a tube with selenite F broth. One loopful of the saline suspension was plated immediately on SS agar with saccharose (Difco) and desoxycholate-citrate agar (Difco). The selenite broth culture was incubated overnight before being plated on the same media. Culture plates were inspected after 18 hours' incubation and colonies were picked off for final identification by fermentation and agglutination tests.

Results

The results of the culture of the rectal swabbings are shown in Table II. Dysentery bacilli (*Shigella flexneri* or *Shigella sonnei*) were found in 6 cases in the winter series and in 14 cases in the summer series. *Shigella flexneri* was identified in 5 out of 6 cases in winter and 7 out of 14 cases in summer. Organisms of the Salmonella group were present in 3 of the dysentery cases and in 9 other patients in the summer series. Neither Shigella nor Salmonella organisms were isolated from members of the control group. A growth of *B. proteus* was obtained from 6 members of the winter series, from 26 members of the summer series and from 6 members (12%) of the control group.

TABLE II. GROWTH OBTAINED ON SELECTIVE MEDIA FROM RECTAL SWABS ON 200 AFRICAN CHILDREN SUFFERING FROM DIARRHOEA AND 50 CONTROLS

Type of Organisms	*Number of Patients*		
	Winter	*Summer*	*Controls*
Shigella flexneri	5	7*	—
Shigella sonnei	1	7†	—
Salmonella	—	9	—
Proteus	7	35	6 (12%)
Coliform organisms	16	22	24 (48%)
Others	10	8	2 (4%)
No growth	61	12	18 (36%)
	100	100	50 (100%)

* 2 of these cases had Salmonella organisms in their stools.
† 1 of these cases had Salmonella organisms in his stools.

It is noteworthy that the aforementioned selective media caused complete inhibition of growth of the bacteria obtained by swabbing in 61 cases during winter,

in 12 cases during summer and in 18 cases (36%) in the control series.

Discussion

In a previous communication from this hospital[3] it was stated that stool cultures from 20 cases with severe diarrhoea had not yielded any pathogenic bacteria. However, the investigation was designed primarily to detect specific strains of *B. coli* and was not suited to the recovery of dysentery bacilli.

In the present survey no attempt was made to identify any potentially pathogenic strains of *B. coli* and the media employed favoured the growth of Shigella and Salmonella organisms. The former were found in 6% of children with diarrhoea in winter and 14% in summer. Previous work carried out at this hospital indicates that the number of swabs positive for Shigella organisms might have been 10-20% higher, if specimens had been submitted repeatedly from each patient during the course of his illness. However, it appears certain that dysentery was present in not more than 20% of the children.

Shigella flexneri was the commonest cause of dysentry in our patients. This differs from present-day experience in Great Britain[4] and the State of New York[2] where *Shigella sonnei* is more prevalent.

Some light has been thrown on the causation of those cases of 'gastro-enteritis' at this hospital which cannot be attributed to infection with dysentery bacilli. Salmonella organisms were discovered in 12 patients of the summer series. (In our experience at this hospital, extending over several years, infection with Shigella is 2-3 times as common as infection with Salmonella organisms.) Proteus was grown frequently from patients during the summer period. There is evidence that some strains of Proteus can cause diarrhoea in man,[5] and it is possible that during the summer they are an important cause of diarrhoea in this area.

Most subjects in the winter series were suffering from upper-respiratory-tract infection, and the diarrhoeal attacks in these patients could probably be classed as 'parenteral' in origin. It is noteworthy that no growth was obtained on the selective media in 61% of the winter series.

It was only occasionally possible to distinguish on clinical grounds between patients suffering from dysentery and those with 'non-specific gastro-enteritis'. This did not surprise us, because the clinical picture of diarrhoea in children is governed, apart from the infecting agent, by such factors as the infecting dose, the age of the patient, his state of nutrition and, under certain circumstances, atmospheric temperatures. This aspect of the diarrhoea problem will be dealt with in a future communication.

REFERENCES

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4. *Editorial* (1955): Brit. Med. J., **1**, 401.
5. Cope, E. J. and Kasper, J. A. (1949): J. Bact., **57**, 259.