A Preliminary Study on Diarrhoeal Disease in Preschool Children

Pages with reference to book, From 273 To 277

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Abstract

Diarrhoeal diseases were more frequent in male children upto one year of age. The causative agents were bacteria (55%), Rotavirus (30%) and parasites (9%). Of the bacterial group Klebsieila (54%) and Enteropathogenic Esch. coli (EPEC) (34%) were more frequently encountered. None of the 24 strains of Esch. coli were positive for heat labile toxin (LT).
Rotavirus diarrhoea was mainly seen in winter due to Giardia lamblia (JPMA 33: 273,1983).

Introduction

Diarrhoeal disease in infants and preschool children is a major cause of morbidity and mortality in our country. The aetiological agents of infantile diarrhoea are parasites, bacteria and viruses (Ingram et al., 1966). Among the viruses Rotavirus has assumed a considerable importance in recent years. It was detected in 26% of cases in a study conducted in Islamabad. Other pathogens were Enteropathogenic Esch. coli (EPEC) and Giardia lamblia (Khan et al., 1982). A similar study done at Karachi is presented here.

Material and Method

One hundred and forty samples were obtained after clinical examination from infants and children from the National Institute of Child Health. The children were up to 2 years of age and mostly from lower socio economic status. They were both breast and bottle fed.
For parasites direct microscopic examination in saline and iodine was performed for ova and cyst. Bacteriological investigations were carried months. Nine percent of parasitic diarrhoeas were out by direct inoculation of fecal sample on MacConkey's Agar and S.S. Agar. Plates were in cubated aerobically for 24 to 48 hours at 37°C. Identification was done by gram staining colony characteristics and biochemical reactions. Esch. coli were serotyped to detect the enteropathogenic group.
Detection of Rotavirus in fecal samples was done by ELISA technique using Rotazyme kit.

Assay for Esch. Coli Enterotoxin

The heat labile toxin (LT) of Esch.coli was detected by the Modified Elek test.
Preparation Biken Agar No. 2.
Casamino acid (Difco) 2%, yeast extract (Difco) 1%, NacI 0.2 5%, $K_2H\ Po_4$ 1 .5%, Trace salt solution (5% Mgso4, 0.5% $Fecl_3$, 2% $Cocl_2$ (6 H_2O Cobalt Chloride), and 1.5% Noble agar (Difco) pH 7.5
Lincomycin 90 ug/ml was added to the medium.

Modified Elek Test

Esch. coli strains to be examined were inoculated on Biken agar plates and incubated for 40 hours at 37°C. Saturate a Whatman paper disc in polymyxin B solution containing 20,000 lu/mi and place it on the growth formed on the plate. Incubate the plates at 37°C for 5. hours. After incubation 25ul of the

antiserum was placed in the central well made about 5mm from the colony to be tested, incubate the plate again at 37°C for 24-48 his, and then examine for a precipitin line.

Results

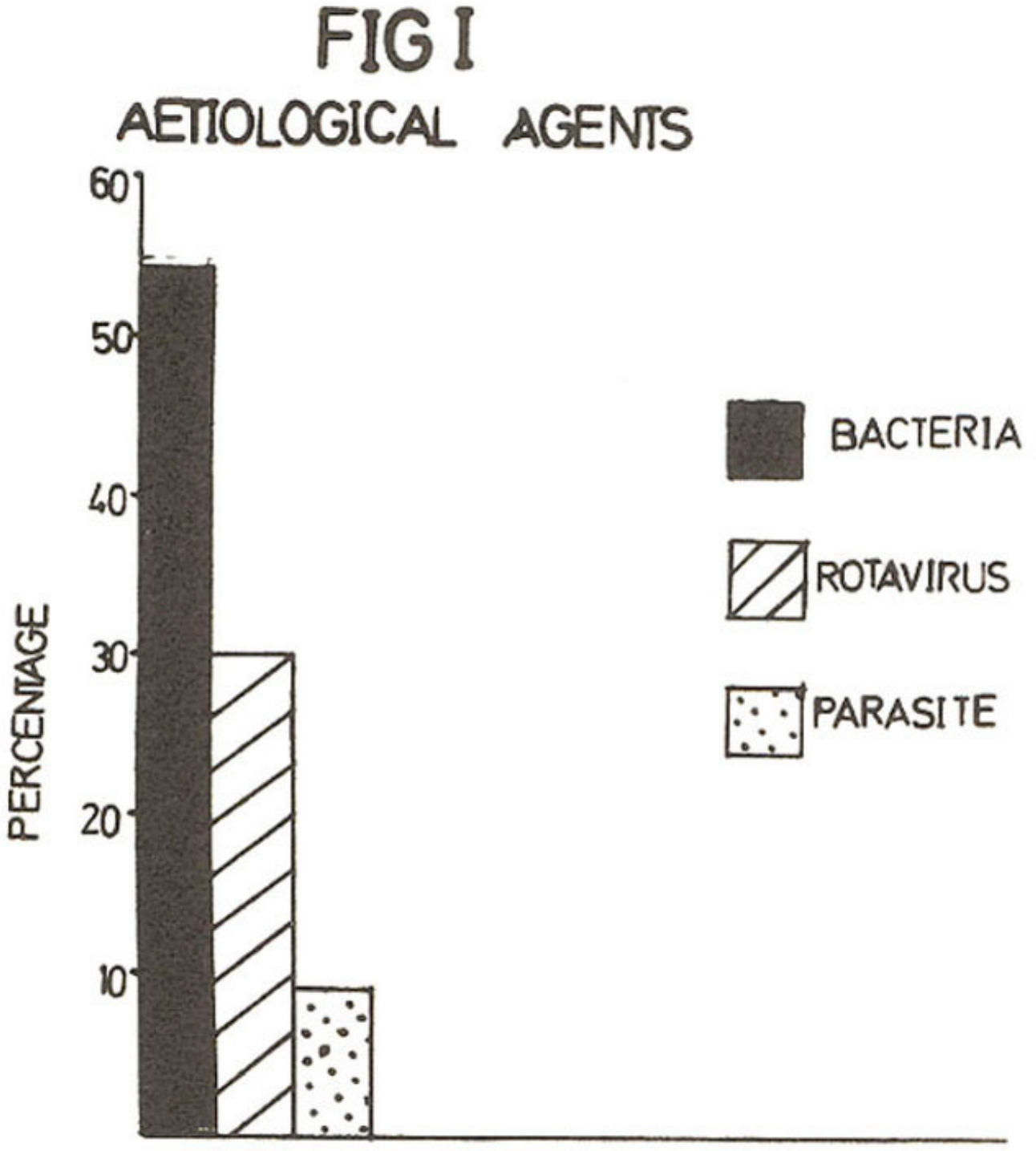


Fig. 1 shows the aetiological agents of diarrhoea in 140 fecal samples. Bacterial diarrhoea was more frequent (5 5%) than viral (30%) and parasitic (9%). Microorganisms isolated are shown in table. I.

Table – I Microorganisms.

		Number	Percent
Klebsiella		38	54.2
Esch. coli		28	34.2
Shigella	dysenteriae	5	7.1
	flexeneri		
Proteus	morgoni	4	5,7
	mirabilis		
Pseudomonas	aeuroginosa	2	2.8
Alkalecens	dispar	2	2.8
Vibrio	cholera	1	1.4
Candida	albicans	1	1.4

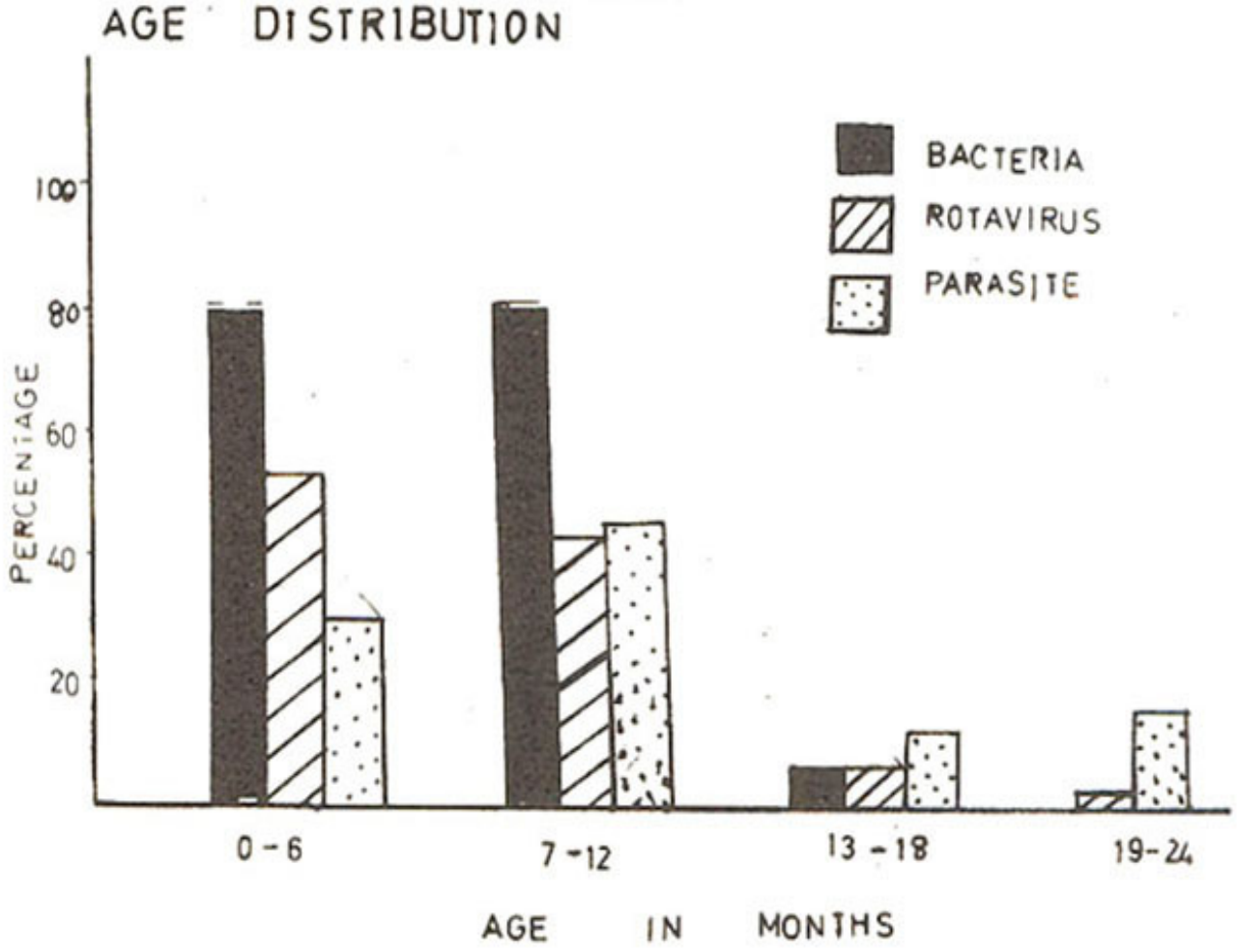
Kiebsiella was most frequently isolated followed by Esch. coil (EPEC).
Serotyping of Esch. coil is shown in table II.

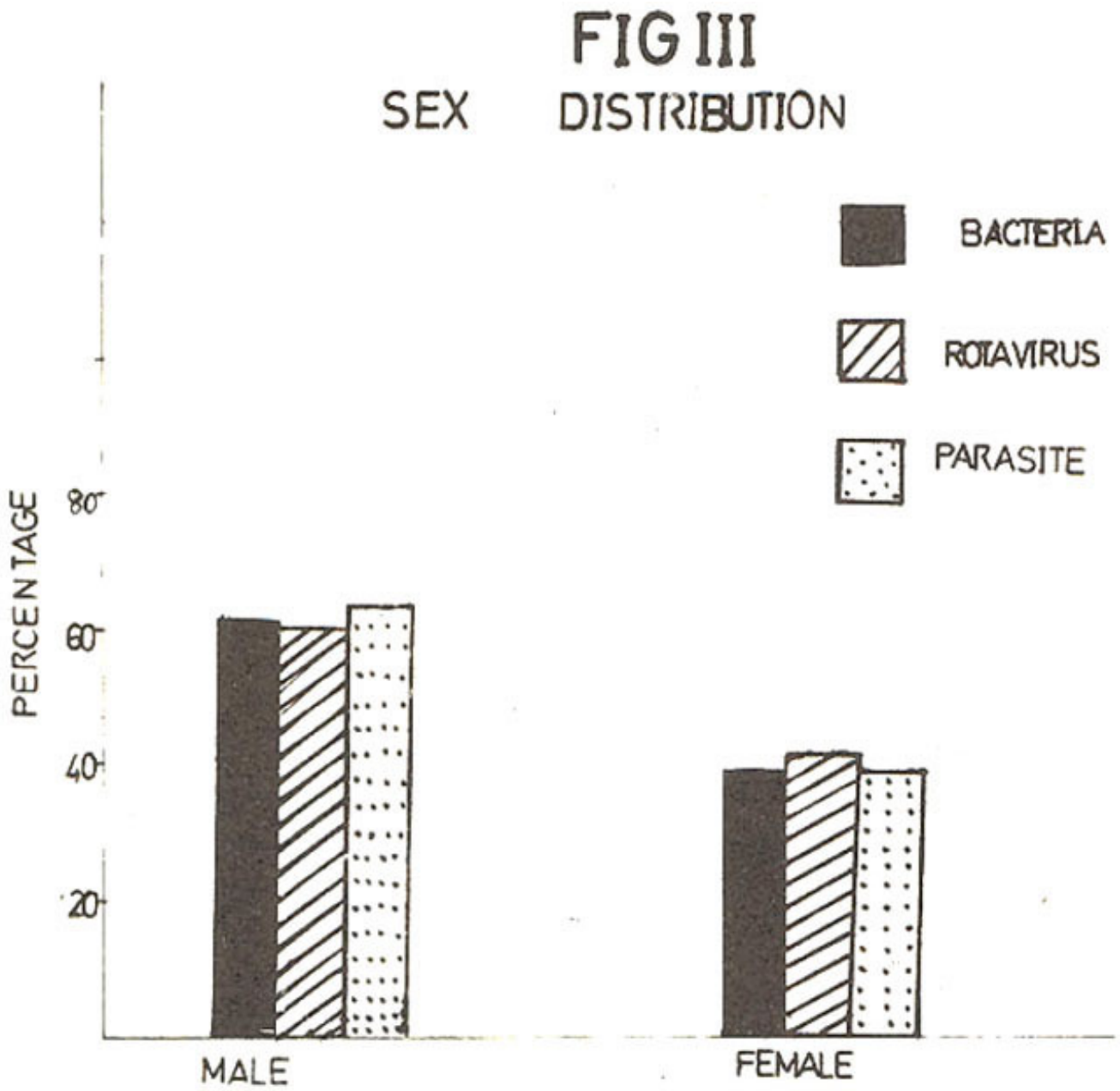
Table–II Serotyping.

		Number	Percent
EPEC	Poly A	2	6.2
EPEC	Poly B	30	93.7
Group	I $(O_{26}K_{60}+O_{55}K_{59}+O_{11}K_{58})$	2	8.3
Group	II $(O_{86}K_{61}+O_{119}K_{69}+O_{127}K_{63})$	2	8.3
Group	III $(O_{125}K_{70}+O_{126}K_{71}+O_{128}K_{67})$	28	34.2
Group	IV $(O_{114}K_{90}+O_{124}K_{72}+O_{142}K_{86})$	–	–

The maximum number of enteropathogenic Esch. coil were found in group Ill i.e. (0125 K+0126 K71+0I 28 K67). Twenty four strains of Esch. coil were tested for the production of LT toxin. Of these only 18 were of t'ie enteropathogenic group. None of these strains were LT positive.
The age and sex of the patients is shown in Figs 2 and 3 respectively.

FIG II





All types of diarrhoeas were more frequent in males. Diarrhoea due to bã&erial and viral infections were more commonly seen upto one year of age. Frequency of parasites as causative agents for diarrhoea in-creased gradually from 6 24 months.

Discussion

The pattern of diarrhoeal disease has changed in Karachi over the years. Bacillary dysentry and parasitic infestations were more frequent in the past than in recent years. Shigella (12.4%) was the commonest bacterial pathogen followed by Esch. coli (6.7%) in the series reported by Ingram et al. (1966), while in the present study Kiebsiella and Esch. coli were more frequent. In Bangladesh Esch. coli Enterotoxigemc (ETEC) was mostly isolated enteropathogen followed by Shigella (Black et al., 1981). None of the Esch. coli tested were positive for heat labile toxin (LT) in this study while Reis et al. (1980) found LT in stools of patients and controls and heat stable toxin (ST) only in patients with diarrhoeal symptoms.

Viruses were infrequent in diarrhoeal stools (Park et al., 1966) but now Rotavirus has assumed a considerable importance. The occurrence of Rotavirus diarrhoea was similar in Islamabad (Khan et al., 1982) while in Bangladesh the frequency was greater (Black et al., 1980).
Variances were reported in the age group in children with Rotavirus diarrhoea. In the present series and others (Al Nakib et al., 1980; Khan et al., 1982; Urasawa et al., 1981) more Rotavirus positive cases were reported in children upto one year while Steinmann et al. (1981) reported
Rotavirus in 23.3% of infants below 6 months. Other workers have found the infection to be uncommon in the first six months of life (Gurwith et al., 1981; Hull et aL, 1982; Sengupta et al., 1981; Soeharto et al., 1981).
Seasonal variation regarding rotavirus in-fection was also observed by Al Nakib et al. (1980), Black et al. (1980) and Radda and Kunz (1981), while Suzuki et al. (1981) and Soeharto et al. (1981) found Rotavirus in 21% and 38% respectively in children throughout the year. Rotavirus was also detected in summer and in thy season (Hull et al., 1982; Robins Browne et al., 1980). Giardia lamblia was the only parasite reported in the present study. Pickering et al. (1981) and Monaghan et al. (1980) also found giardiasis to be common in infants and children with diarrhoea.
As the aetiological agents of diarrhoea change with time it is important that such studies should be conducted at various intervals in order to determine the frequency variation of infecting organisms.

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