Rotavirus-In Infantile Diarrhoea: A Study In Fifty Cases

DR. MANINDRA R. BARAL*

DR. HEMANG DIXIT**

DR. BRIJ N. CHOUDHARY***

INTRODUCTION

A recent study of diarrhoeal disease pattern at Kanti Children's Hospital over a sixteen month period from November 1976 to February 1978 showed that diarrhoea cases were 16% of all admission and that 9% of diarrhoea cases ended in death. (Baral M. R. et al. Diarrhoeal Diseases Pattern at Kanti Children's Hospital. J. Nep. Med. Assoc. 1978, 16, 29-44). It was noticed in the study that during this period that there was a summer and a winter peak in the incidence of diarrhoeal disease. This summer peak was in April, May and June and the winter peak in November. This study showed that of the diarrhoea occurring during these months, there was no occasion when stool culture showed the presence of any significant organisms. It was presumed then that some of the infection which occurred then was probably due to some viral infection of the gut.

This present study starts where the others left off and covers the period of time from June to September 1978. Except for the month of June, when 23 samples were taken, the other three months which were relatively slack produced only 27 samples. It must be noted however that the fifty cases are infact selected cases for the rectal swabs were taken only from those patients who had not had any treatment for the diarrhoea prior to coming to the

* Senior Paeditrician, Kanti Children's Hospital, Kathmandu.

** Dean, Institute of Medicine, Tribhuvan University.

*** Medical Officer, Kanti Children's Hospital, Kathmandu.

hospital either as an in or out-patient. The second criterion used was that of those who were now selected; only those who complained of watery diarrhoea were included in the series. Consequently this paper only attempts to show that viruses are a cause of diarrhoea in a selected sample of cases. The third point was that most of these cases were admitted into the hospital, but some however were cases which attended the out patients department.

METHOD

Fifty rectal swabs were taken and sent in the phosphate buffer transportation medium to the Cholera Research Laboratory at Dacca, Bangladesh. The method used was the ELISA (enzyme-linked immunosorbent assay) technique. In this test, faecal extract is incubated in polystyrene tube coated with antibodies against newborn calf diarrhoea virus (N. C. D. V.) Bound viral antigens are then reacted with specific antibody linked to peroxidase. Complexed enzyme labeled antibody was detected by adding a suitable enzyme substrate. As a result of the serological relationship between N. C. D. V. and infantile gastroenteritis virus, the test can also be used for the detection of the human virus. The sensitivity of this ELISA for the detection of N. C. D. V. in calf faeces is about 100-fold higher than that of electron microscopy.

INCIDENCE

It was found out that fifteen of the total of fifty cases or 30% were positive for rotaviruses. Of the fifty specimens the fifteen samples that were positive for rotaviruses were samples number 3, 8, 9, 12, 23, 25, 33, 37, 39, 44, 45, 47, 48, 49 and 50.

This particular virus isolated is also known by such terms as 'duo virus', 'reo-like virus' and 'infantile-gastroenteritis virus'. The term 'rotavirus' however seems to be more appropriate for it has within its characteristic double capsid layer, with clearly defined circular outline giving the particle a wheel like appearance.

AGE GROUP

The selected child who had had watery diarrhoea but had not had any treatment for the same ranged from the youngest of eighteen days to one of five years. Of the total number of fifty cases, 28 cases or 56% were under one year of age. Likewise the breakdown of positive cases under and above one year was 9 and 6 respectively. Incidence of viral infection in the two age groups of the selected sample was 32.1% and 27.3% respectively.

STATUS

Most of the patients came from the lower income group. The breakdown of the sample and of those who were infected is as follows:-

	<u>No. of Sample</u>	<u>No. of cases</u>
From Lower income group.....	37	11
From Middle income group.....	12	4
From Higher income group.....	1	-
TOTAL	50	15

The incidence of viral infection in the selected sample is 29.7% for the lower income group and 33.3% in the middle income group. As far as the higher income group is concerned the fact that we had only one case in our samples is probably due to their having treatment from Private Practitioners.

NUTRITIONAL STATUS

The children of both the sample and those who had viral diarrhoea were again divided into four groups viz. average, thin, malnourished and obese. The number of children in each group is given below :-

	<u>Sample No.</u>	<u>Cases No.</u>
Children of average nutrition... ..	13	4
Thin children... ..	19	4
Malnourished children... ..	12	6
Obese children... ..	6	1
TOTAL—	50	15

The thin/malnourished total 62% of the above sample and is representative of the state of nutrition of the patients attending hospital for treatment. In the fifteen cases of Rotavirus infection, the group which was malnourished showed the maximum number of cases. Of the cases which had viral infection, the thin and malnourished as a group accounted for 66.7%.

FEEDING

It was rather difficult to state the exact position as regards to breast feeding for quite a few of the cases had been on the breast and the bottle. However, of the fifteen cases who showed rotavirus infection, one was on rice only and the other feeding habits were as follows :-

Breast feeding only.. .. .5 cases.

Breast/bottle feeding.. .. .5 cases.

Bottle feeding only.. .. .4 cases.

It would seem therefore that as far as viral infections are concerned, there is no apparent evidence of lesser incidence of viral diarrhoea in the breast fed. On the other hand because our sample is very limited it is not justifiable to draw any conclusion from the result.

DISCUSSION

The reason why rotavirus has come to occupy an important place in the aetiology of diarrhoea is due to :-

1. Mode of spread may be different. Not the usual ones such as food or water but rather the child's finger or mouth or oral-oral route (microdroplet) "adult is reservoir and the child is victim". This means that there will be different patterns of spread, under different environmental conditions and different control measures will be applicable (Mosley).
2. Its' being seen more often in children between six months and two years of age but rare after the seventh years. The older children and adults being immune suggest that a vaccine could be protective unlike Cholera, though declining with age in endemic areas, no absolute immunity is in evidence and reinfection can occur.
3. Viral diarrhoea being a leading cause of high mortality in the malnourished children of the developing countries. This is epidemoendemic throughout the year with two peaks resulting in "winter" and "summer" diarrhoea.
4. The fact that the rotavirus infection of the new born nurseries in hospitals of the developed countries has been seen to be endemic throughout the year.

SUMMARY

Examination of fifty rectal swabs taken during a four month period in 1973 has shown that in 30% of cases, the diarrhoea was caused by rotavirus. We have sent rectal swab specimens taken during winter months for further investigations. Our impression is that the watery winter diarrhoea seen under five years of age is mostly due to viral infection. Our first evidence is very important from the point of view that a lot of anti-diarrhoeals are being used in cases of viral diarrhoeas in which they are not likely to do any good.

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