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## RESEARCH ARTICLE

### A DIARRHOEAL OUTBREAK DUE TO ROTA VIRUS IN KOLKATA AND ITS SURROUNDINGS

<sup>\*</sup><sup>1</sup>Bhattacharya, M. K., <sup>1</sup>Sarkar, M. C., <sup>1</sup>Dutta, S., <sup>2</sup>Acharyya, M., <sup>1</sup>Bhattacharya, A. and <sup>3</sup>Sharma Sarkar, B.

<sup>1</sup>Head of Clinical Medicine and Laboratory Science, National Institute of Cholera and Enteric Diseases, P-33, C.I.T. Road, Scheme XM, Belehata, Kolkata - 700 010, India

<sup>2</sup>ID & BG Hospital, Kolkata, India

<sup>3</sup>Bankura Sammilani Medical College, India

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#### ABSTRACT

Modernism Rotavirus is well recognized as a major cause of severe gastroenteritis in young children worldwide. In India 20-30% cases of hospital admission is due to rotavirus etiology. Rotavirus causes upto 5,00,000 childhood death annually in developing countries. Although the incidence of infection in children in industrialized and developing countries is similar, outcomes vary widely. In countries classified by the World Bank as high-income, the risk of dying from rotavirus before age 5 is 1 in 48,680; the equivalent risk in low-income countries is 1 in 205. The Rota virus vaccine which is now available in Indian market is known as Rotarix and another vaccine is Rotateq. All the rota viral diarrhoea cases, 88.5% are due to G1-G4 serotypes which are considered common serotypes. The G9 strain is also to be one of the five important serotypes globally with a relative frequency of 4.1%, however a high occurrence of G9 strains has recently being observed in several countries including India. Rotarix and Rotateq vaccine will be ineffective to control any diarrhoeal outbreak due to rota virus caused by G9 strain. So urgently need a new vaccine including 5 important serotypes containing G9 strain.

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## INTRODUCTION

### Background

Rotavirus is well recognized as a major cause of severe gastroenteritis in young children worldwide (Kapikian *et al.*, 1996). In India 20-30% cases of hospital admission is due to rotavirus etiology (Maiya *et al.*, 1977; Bhan *et al.*, 1987; Singh *et al.*, 1989; Brown *et al.*, 1988; Aijaz *et al.*, 1996). Rotavirus causes upto 5,00,000 childhood death annually in developing countries (Miller and McCann, 2000). Although the incidence of infection in children in industrialized and developing countries is similar, outcomes vary widely. In countries classified by the World Bank as high-income, the risk of dying from rotavirus before age 5 is 1 in 48,680; the equivalent risk in low-income countries is 1 in 205 (Parashar *et al.*, 2003). All children will have rotavirus-associated diarrhoea at least once during the first five years of life (Matsumoto *et al.*, 1989). The clinical manifestation of a rotavirus infection varies from an asymptomatic to mild infection to severe and sometimes life-threatening diseases (Barman *et al.*, 1996).

The main strategy for severe rotavirus disease control is vaccination because rotavirus infections show similar frequency patterns throughout the world, regardless of hygiene and development standards (Kapikian *et al.*, 2001; Fischer and Gentsch, 2004). Therefore, the value of rotavirus strain surveillance in a community has been currently increasing over time. Additionally, characterization of rotavirus outbreaks will help to reveal the current magnitude of the rotavirus-mediated health threat to a community, and will guide the development of appropriate policies of prevention and control (Mehmet Koroglu *et al.*, 2011).

## MATERIALS AND METHODS

ID & BG hospital, Kolkata is a tertiary care infectious diseases State hospital with a separate 60bedded paediatric diarrhoeal ward. It is the highest referral centre of all diarrhoeal cases in our state. On January 2012 an unusual increase in occurrence of childhood diarrhoeal cases was reported at ID & BG Hospital, Kolkata. Therefore a study was conducted by National Institute of Cholera and Enteric Diseases (NICED) among hospital admitted paediatric (<5 years) diarrhoeal cases (three or more liquid stool over last 24 hours period) on 30 and 31<sup>st</sup> Jan 2012.

\*Corresponding author: Bhattacharya, M. K.

Head of Clinical Medicine and Laboratory Science, National Institute of Cholera and Enteric Diseases, P-33, C.I.T. Road, Scheme XM, Belehata, Kolkata - 700 010, India.

## Details of all 14 study cases

Sl. No	Age	Case No	Type of Diarrhoea	Vomiting	Fever	Abdominal Pain	Degree of Dehydration	Lab sample No	Rota Virus
1	7 mo	R/N -2021	watery	+	+	+	Some	NT-5484	+
2	2mo18 days	R/N-2020	watery	-	-	-	Some	NT-5485	-
3	1 yr. 6 mo	R/N-1941	watery	-	-	-	Some	NT-5486	+
4	10 mo	R/N-2042	watery	+	-	-	Some	NT-5487	+
5	1 yr 6 mo	R/N-1981	watery	+	+	-	Some	NT-5488	-
6	1 yr 6 mo	R/N-2012	watery	+	-	-	Severe	NT-5489	-
7	1 yr 8 mo	R/N-2008	watery	+	-	-	Severe	NT-5490	+
8	3 yr	R/N-2009	watery	+	-	+	Some	NT-5491	-
9	1 yr 6 mo	R/N-2037	watery	-	-	-	Some	NT-5492	+
10	1 yr 6 mo	R/N-2045	watery	+	+	-	Some	NT-5493	+
11	7 mo	R/N-1968	watery	+	-	+	Some	NT-5494	+
12	1 yr 6 mo	R/N-2004	watery	+	-	+	Some	NT-5495	+
13	1 yr	R/N-1965	watery	+	-	-	Some	NT-5496	+
14	11 mo	R/N-1997	watery	+	-	-	Severe	NT-5497	+

A total of 14 patients (<5 years) got admission on these two days with recent onset diarrhoeal episodes. All cases are from urban Kolkata and its surrounding area. Among these 14 patient 11 presented with vomiting, 4 presented with associated abdominal pain and 3 presented with fever on admission. All children are having acute watery diarrhoea at presentation. Out of these 14 children 11 have some dehydration and 3 of them have severe dehydration on admission. All some dehydration cases are treated with Oral Rehydration Solution (ORS) and oral antibiotics Ofloxacin and Ornidazole, and 3 severe dehydration cases are treated with Intravenous Fluid Ringer Lactate, ORS and antibiotic Ofloxacin and Ornidazole. Stool sample of these 14 patients are collected and send to the NICED laboratory for etiological diagnosis and serotype analysis.

### Conclusions

The Rota virus vaccine which is now available in Indian market is known as Rotarix. It is a monovalent live attenuated human rotavirus vaccine derived from the human 89-12 rotavirus strain grown in Vero cells and contains the G1P1<sup>[8]</sup> strain administered orally in a 2-dose schedule to infants of approximately 2 and 4 months of age. Rotarix does not contain G9 strain in its component. But surprisingly all 10 rotavirus positive stool sample in our study are G9 positive. There is an urgent need to introduce and affordable efficacious rota virus in childhood immunization programme in India whereas WHO recommended and promote the use of the licenced rota virus vaccine in the developing countries. No data exists to support the efficacy of Rotarix and Rotateq in India. Where the vaccine have been recently licenced on the basis of single immunization studies in which the vaccine efficacy lower than what had been observed in developing countries. Worldwide all the rota viral diarrhoea cases, 88.5% are due to G1-G4 serotypes which are considered common serotypes. The G9 strain is also to be one of the five important serotypes globally with a relative frequency of 4.1%, however a high occurrence of G9 strains has recently being observed in several countries including India. Rotarix and Rotateq vaccine will be ineffective to control any diarrhoeal outbreak due to rota virus caused by G9 strain. Therefore we need to develop a new vaccine which includes 5 important serotypes containing G9 strain. So that we would be able to combat diarrhoeal outbreak/epidemic caused by rota virus also due to G9 strain.

Hence, we need to develop a policy for continuous monitoring for early recognition of any changing pattern of the diarrigenic strains causing diarrhoea which will help us to develop new vaccine to combat any future epidemic caused by new diarrigenic strains.

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