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Short Report:

Pediatric Rotavirus Gastroenteritis: A 2 year Analysis to Understand Current Prevalence in Mumbai

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Abstract:
Many studies have established the high prevalence of paediatric Rotavirus gastroenteritis in India. The importance of rapid diagnosis of rotavirus infection has also been stressed upon, to initiate prompt rehydration therapy and prevent unnecessary use of antibiotics .We undertook a retrospective analysis of 327 paediatric stool specimens to understand the current prevalence and seasonal distribution of cases in Mumbai and its surrounding areas. Overall Rotavirus positivity rate was 37.9 %, with peak positivity in winter seasons. Infections were more common upto 2 years of age. Incidence of bacterial and parasitic coinfections was low.

Key Words: Rotavirus; Paediatric diarrhea; Antigen detection

Introduction:

A number of Indian studies have established the high prevalence of Paediatric Rotavirus gastroenteritis in India.(1-5)The importance of rapid diagnosis of rotavirus infection has also been stressed upon, to initiate prompt rehydration therapy and prevent unnecessary use of antibiotics.(1,2,6,7) Nosocomial rotaviral outbreaks in paediatric wards and neonatal nurseries are known to occur and are difficult to contain.(6) Rotavirus antigen testing for confirmation of infection, or as an epidemiological tool is usually not included in the diagnostic protocol for acute pediatric diarrhoea, since a specific diagnosis of rotavirus gastroenteritis does not change the management significantly and also does not help in case of other viral etiology. With this background in mind, we undertook retrospective laboratory data analysis of 327 stool specimens, taken from children < 7 years of age with acute diarrhoea, collected over a period of 22 months (August 2008 to May 2010).This was done with an aim to understand the current prevalence and seasonal distribution of cases in Mumbai. Tests performed on each specimen included 1) Routine Stool macroscopic and microscopic examination, 2) Modified acid fast staining for Cryptosporidia and 3) Rotavirus antigen detection. Rotavirus antigen was detected by using a commercially available rapid antigen detection kit, RIDA®QUICK [R-Biopharm AG, Germany]. The kit uses the principle of Immunochromatography and claims a sensitivity and specificity of 100% & 94.4% respectively, when compared with PCR.

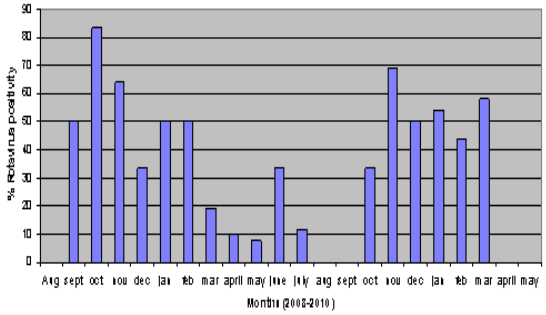
Results and Discussion:

Data analysis showed that 124/327 specimens i.e. 37.9 % tested positive for Rotavirus antigen. The antigen positivity was as high as 45 % in children up to 2 years of age and declined to 14.3 % in the 5-6 years age group.

Table 1: Association of Rotavirus positivity with Key Microscopy findings

	Microscopy Findings			
		WBC		
	Mucus	3-10/ High power field	>10/High power field	RBC
Specimens Positive for Rotavirus Antigen (n=124)	62	5	0	6
Specimens negative for Rotavirus Antigen (n=203)	42	30	3	34

As seen in Table 1, WBCs and RBCs were more commonly associated with the Rotavirus negative specimens (n=203), pointing to a likely bacterial infection. Since stool cultures had not been performed on these 327 specimens, we were unable to ascertain the type of bacterial infection. The 10/124 rotavirus positive specimens also showed presence of WBCs and/or RBCs, may be indicating a possibility of concomitant bacterial infection. *Giardia lamblia* and Cryptosporidia were detected in 10 and 6 stools respectively. Giardia-rotavirus co-infection was seen in 5 specimens, while cryptosporidia-rotavirus coinfection was seen in 1 case.



Graph I: Seasonal Trend in Rotavirus Positivity

As indicated in Graph 1, positivity trend analysis indicated that infections occurred more during the cooler winter months , with a relative decline in the monsoons.

Indian studies show a wide range of Rotavirus prevalence rates, ranging from 4 to 62.6%.(1,3,4,6,8) It can be attributed to the differences in age groups studied, detection methods used, geographical location and the season.(1,3,4,6,8) The positivity rates also vary between various settings, i.e. hospitalizations, symptomatic and asymptomatic infections and nosocomial infections.(5) Though the overall prevalence rate in our study was similar to other study findings, the peak seasonal positivity was much higher, i.e. upto 83% .Since our study included patients mainly from Mumbai and its surrounding areas, it is possible that Rotavirus prevalence is higher in Mumbai due to the overcrowding and poor sanitation. A limiting factor of our analysis was the inability to differentiate between community & nosocomial infections, or ascertain whether these large numbers of seasonal cases were due to a localized institutional or community outbreak. However, the data does point to the need of larger prospective studies to assess the current rotavirus prevalence in Mumbai, especially in context of inpatient and outpatient settings. The utility of rotavirus antigen testing as an epidemiologic tool in infection control and prevention needs to be further evaluated, especially in paediatric set-ups.

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