REFERENCES

1. Saluja T, Sharma SD, Gupta M, Kundu R, Kar S, Dutta A, *et al*. A multicenter prospective hospital based surveillance to estimate the burden of rotavirus gastroenteritis in children less than five years of age in India. Vaccine. 2014;32S:a13-19.
2. World Health Organization. Generic Protocol for Monitoring Impact of Rotavirus Vaccination on Gastroenteritis Disease Burden and Viral Strains. Geneva, Switzerland. 2008. Available from: *http://whqlibdoc.who.int/hq/2008/WHO_IVB_08.16_eng.pdf*. Accessed on May 30, 2014.
3. Broor S, Singh V, Venkateshwarlu, Gautam S, Mehta S, Mehta SK. Rotavirus diarrhoea in children in Chandigarh, India. J Diarrhoeal Dis Res. 1985;3:158-61.
4. Yachha SK, Singh V, Kanwar SS, Mehta S. Epidemiology, subgroups and serotypes of rotavirus diarrhea in North Indian communities. Indian Pediatr. 1994;31:27-33.
5. Kang G, Desai R, Arora R, Chitamabar S, Nail TN, Krishnan T, *et al*. Diversity of circulating rotavirus strains in children hospitalized withdiarrhea in India, 2005-2009. Vaccine. 2013;31:2879-83.
6. Kawai K, O'Brien MA, Goveia MG, Mast TC, El Khoury AC. Burden of rotavirus gastroenteritis and distribution of rotavirus strains in Asia: A systematic review. Vaccine. 2012;30:1244-54.
7. Sharma S, Ray P, Gentsch JR, Glass RI, Kalra V, Bhan MK. Emergence of G12 rotavirus strains in Delhi, India, in 2000 to 2007. J Clin Microbiol. 2008;46:1343-8.
8. Mukherjee A, Chattopadhyay S, Bagchi P, Dutta D, Singh NB, Arora R, *et al*. Surveillance and molecular characterization of rotavirus strains circulating in Manipur, North-eastern India: Increasing prevalence of emerging G12 strains. Infect Genet Evol. 2010;10:311-20.
9. Miles MG, Lewis KD, Kang G, Parashar UD, Steele AD. A systematic review of rotavirus strain diversity in India, Bangladesh and Pakistan.Vaccine. 2012;30:A131-9.
10. Jain S, Vashistt J, Changotra H. Rotaviruses: Is their surveillance needed? Vaccine. 2014;32:3367-78.

Immunochromatography-based Diagnosis of Rotavirus Infection in Acute Diarrhea

Documentation of rotavirus diarrhea in a rural, resource-poor setting is a difficult task. We analyzed stool samples of 103 children admitted for acute diarrhea in a pediatric hospital in Bijnor, UP, India, using a simple bedside immunochromatography kit. Rotavirus infection was detected in 47 out of total of 103 children (45.6%).

Keywords: *Dehydration, Epidemiology, Surveillance.*

Estimates suggest that India has a high burden of rotavirus diarrhea, and related mortality [1-3]. Most studies evaluating rotavirus infection used the standard diagnostic techniques like ELISA. Documentation of rotavirus disease in semi-urban and rural areas presents challenges due to non-availability of this diagnostic facility. Immunochromatography is a relatively economical bedside method to detect rotavirus infection.

This study was conducted at a pediatric hospital based in a semi-urban area in Bijnor district of Western Uttar Pradesh, India during 2010 and 2011. Rotavirus detection was performed using VIKIA Rota-Adeno kit (M/s BioMérieux) on stool samples of children less than 5 years of age, suffering from acute diarrhea and requiring hospitalization. Acute diarrheal illness was defined as occurrence of ≥3 watery stools and/or forceful vomiting, and severity was categorized as per Clarke and Vesikari scoring systems [4,5]. Statistical analysis was conducted using chi-square and unpaired *t*-tests. The study was cleared by hospital's ethics committee, and informed consent was obtained from the parents of all included children.

TABLE I CHARACTERISTICS OF THE STUDY PARTICIPANTS

	Rotavirus positive (n=47)	*Rotavirus pegative (n=56)*
Age (mo)*	7.6 (4.6)	7.8 (5.4)
Male gender, *n* (%)	38 (80.8)	38 (67.8)
Lower SES	11 (23.4)	17 (30.36)
Rural residence, *n*(%)	29 (61.7)	36 (64.3)
Diarrhea duration*	6.1 (5.3)	4.5 (4.3)
Vomiting	24 (51%)	32 (57.1%)
Severity as per Clarke scoring system		
Mild, *n* (%)	11 (23.4)	13 (23.2)
Moderate, *n* (%)	33 (70.2)	42 (75.0)
Severe, *n* (%)	3 (6.4)	1 (1.8)
Severity as per Vesikari Scoring system		
Moderate, *n* (%)	5 (10.6)	7 (12.5)
Severe, *n* (%)	42 (89.4)	49 (87.5)

**Mean (SD); SES: Socioeconomic status; all P >0.05.*

During the study period, 103 under-five children hospitalized due to acute diarrhea were tested. Key demographic features are listed in ***Table* I**. Most of the testing occurred in months of May, June and July in both the years (about 98% of total testing for year 2010 and 73% of

total testing for year 2011). Rotavirus was detected in 47 (45.6%) children. The disease characteristics, except severity, were similar for rotavirus-positive and rotavirus-negative cases as per Clarke and Vesikari scoring system. However, these two scales differ greatly in categorizing the severeity. As the Clarke score does not include direct assessment of dehydration, it is less likely to identify an episode of disease as severe, as compared to Vesikari score [6].

The rotavirus disease proportion in this study is close to the earlier reported studies in hospitalized children using ELISA for diagnosis of infection. An earlier study showed good sensitivity and specificity of rapid diagnostic kit when compared to standard diagnostic test [7], whereas another study reported high false positivity [8]. Limitations of the study include small sample size, and lack of comparison of the results with the standard diagnostic method. These results might not be generalized or representative of the actual epidemiology. In conclusion, the study re-affirms that significant proportion of acute diarrhea in hospitalized under-five children is caused by rotavirus. There is a need to evaluate the rapid diagnostic kits *vis-à-vis* standard diagnostics.

***VIPIN M VASHISHTHA, SANDEEP THACKER AND GAJANAN SUDHIR NAMJOSHI**
*Mangla Hospital and Research Center, Bijnor, UP, India. *vipinipsita@gmail.com*

REFERENCES

1. Tate JE, Burton AH, Boschi-Pinto C, Steele AD, Duque J, Parashar UD, *et al*. 2008 estimate of worldwide rotavirus-associated mortality in children younger than 5 years before the introduction of universal rotavirus vaccination programmes: A systematic review and meta-analysis. Lancet Infect Dis. 2012;12:136-41.
2. Kang G, Arora R, Chitambar SD, Deshpande J, Gupte MD, Kulkarni M, *et al*. Multicenter, hospital-based surveillance of rotavirus disease and strains among indian children aged <5 years. J Infect Dis. 2009;200:S147-53.
3. Ramani S, Kang G. Burden of disease and molecular epidemiology of group A rotavirus infections in India. Indian J Med Res. 2007;125:619-32.
4. Ruuska T, Vesikari T. Rotavirus disease in Finnish children: use of numerical scores for clinical severity of diarhoeal episodes. Scand J Infect Dis.1990;22:259-67.
5. Clark HF, Borian FE, Bell LM, Modesto K, Gouvea V, Plotkin SA. Protective effect of WC3 vaccine against rotavirus diarrhea in infants during a predominantly serotype I rotavirus season. J Infect Dis. 1988;158: 570-87.
6. Givon-Lavi N, Greenberg D, Dagan R. Comparison between two severity scoring scales commonly used in the evaluation of rotavirus gestroenteritis in children. Vaccine. 2008;26:5798-801.
7. de Rougemont A, Kaplon J, Billaud G, Lina B, Pinchinat S, Derrough T, *et al*. Sensitivity and specificity of the VIKIA Rota-Adeno immuno-chromatographic test (bioMérieux) and the ELISA IDEIA Rotavirus kit (Dako) compared to genotyping. Pathol Biol. 2009;57:86-9.
8. Ye S, Roczo-Farkas S, Whiley D, Lambert S, Robson J, Heney C, *et al*. Evidence of false-positive results in a commercially available rotavirus assay in the vaccine era, Australia, 2011 to 2012. Euro Surveill. 2013;18:pii:20483.

Association of Rotavirus Gastroenteritis with Histo-blood Group Antigens

Association of rotavirus gastroenteritis with histo-blood group antigens in children younger than 5 years admitted with diarrhea (*n*=389) was studied. Distribution of blood groups in rotavirus positive (*n*=96) and rotavirus negative (*n*=51) diarrhea gastroenteritis cases did not show any susceptibility to any blood group; blood group O seemed to be protective.

Keywords*: Epidemiology, Diarhea, Risk.*

Rotavirus is the predominant cause of severe diarrhea in children in both, developed and developing countries [1]. The discovery that cell attachment protein VP8 of human rotavirus specifically interacts with A-type Histo-Blood Group Antigens (HBGA) [2,3] have prompted rotavirus epidemiologic studies in relation to host HBGA phenotypes [4]. A recent study has indicated that the binding pattern of rotavirus to different HBGAs is strain-dependent [5] necessitating epidemiological studies in different populations. We aimed to study the association of rotavirus infection with HBGA phenotype.

This study was conducted between October 2013 to July 2014, and enrolled under-five children admitted with diarrhea to Capital Hospital Bhubaneswar, Odisha. Approval was obtained from human ethical committee of RMRC, Bhubaneswar. Children admitted to the hospital with three or more watery stools within 24 hrs (WHO definition) were enrolled into the study. Fecal samples (*n*=389) and finger prick blood (*n*=147) were collected from the enrolled children whose parents/guardians