

Correspondence

Occurrence of group B rotavirus infections in the outbreaks of acute gastroenteritis from western India

Sir,

Group B rotaviruses (GBRs) are known to infect humans and different species of animals¹. Association of human GBRs as enteric pathogens was established in devastating epidemics of diarrhoea in China during 1982-1987^{2,3}. Other than China, GBR has been identified mainly in sporadic cases of diarrhoea in India, Bangladesh and Myanmar⁴⁻⁷. In an outbreak of gastroenteritis that occurred in Daman, Union territory of India in 2000, GBR infections were detected⁸. Thereafter, no reports of GBR in outbreak cases are documented either from India or from other parts of the world. We report here occurrence of mainly GBR infections in outbreaks of acute gastroenteritis (AGE) recognized in two different States of India in two different years.

In February 2004, Surat in Gujarat State encountered an outbreak of gastroenteritis. A total of 295 cases including 22 hospitalized and 273 visiting OPD of municipal corporation hospital, Muglisara, Surat were recorded. Three faecal specimens collected from hospitalized adults were received at National Institute of Virology, Pune. All three specimens were tested positive for GBR in RT-PCR of *NSP2* gene carried out by the protocol described earlier⁹ and negative for group A rotavirus by antigen capture ELISA (Generic Assay, Germany). All three specimens also showed GBR specific RNA migration pattern (4-2-1-1-1-1-1) on polyacrylamide gel (data not shown). According to the information from health officials of the hospital, drinking water supplied in pipes was probably contaminated with sewage resulting in rampant AGE infections within a week in the inhabitants of about 14 localities.

An epidemic of gastroenteritis occurred in the summer months (April-May) of 2009 affecting two villages, Kalambi and Khanderajuri of Sangli

district of Maharashtra was brought to the notice of investigating team by District Health Officer, Sangli. A total of 229 patients were reported from primary health centres of the respective villages. Preliminary tests carried out on a few water and faecal samples for bacteria in the public health laboratory of Sangli district was found to be negative. Faecal specimens (n=23) and rectal swabs (n=6) collected from a total of 29 (22 from Kalambi and 7 from Khanderajuri) cases who visited public health centres for the medical treatment were examined for identification of viral aetiological agents. GBR was detected in 5 (17.2%) (4 faecal and 1 rectal swab) specimens by RT-PCR performed using *NSP2* gene specific primers⁹. No other enteric viruses (group A rotavirus, norovirus, enteric adenovirus, astrovirus and enterovirus) were detected in any of the specimens indicating only GBR as the major aetiologic agent associated with this outbreak. Investigation revealed that the villages were suffering from water shortage due to summer and that the wells in the villages were supplied with water from the regional water station through pipes which carried leakages. It is likely that the piped and well water used for drinking purpose by inhabitants was contaminated. Occurrence of multiple but scattered cases of gastroenteritis in the two villages in a short period was suggestive of well water as a common source of infection.

Sequencing and phylogenetic analysis of the partial *NSP2* genes (434 bp) of all of the eight (3 from Surat and 5 from Sangli district) GBR strains showed their clustering with GBR strains from Indian-Bangladeshi lineage of genotype G2 with higher (98.3-100%) nucleotide identity as compared to those of the Chinese lineage (93.3-94.1%) (Fig.). Close genetic relationship with other strains (CAL-1, IDH-084, IC-008) of Indian origin suggested endemicity of such strains in different geographical regions of India.

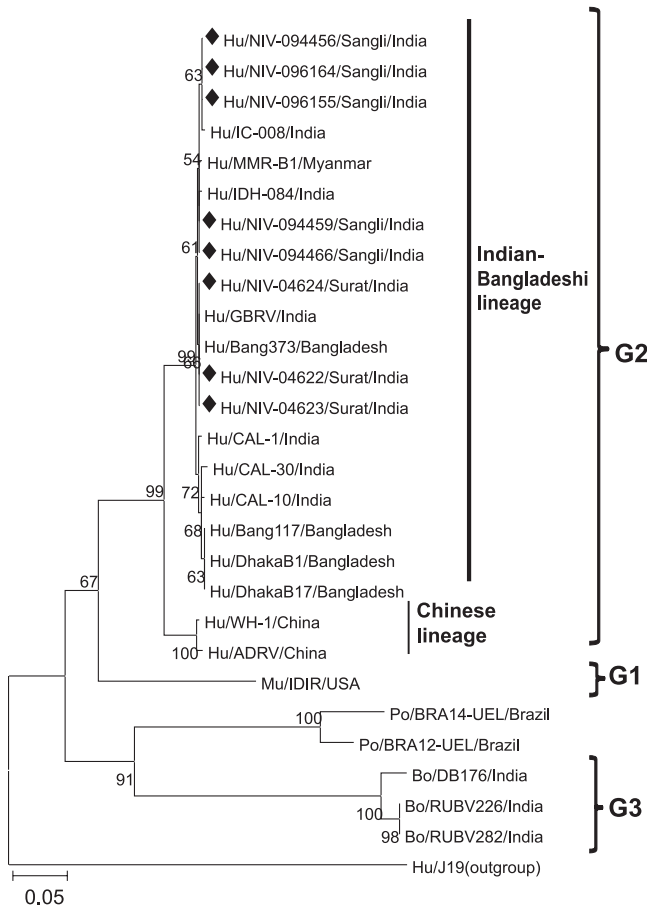


Fig. Phylogenetic dendrogram of partial *GBR NSP2* gene (56-412 bp). ♦ denotes the strains of the present study (accession numbers: HQ425484-HQ425491). For each strain, the following data are given: species/strain name/country name. The reference strains included: IDH-084, IC-008, CAL-1, CAL-10, CAL-30, GBRV, DhakaB1, DhakaB17, Bang117, Bang373, MMR-B1, WH-1, ADRV, IDIR, BRA14-UEL, BRA12-UEL, RUBV226, DB176, RUBV282 and J19. The scale represents genetic distance. Hu, human; Bo, bovine; Po, porcine; Mu, murine.

GBR strains have known potential to perpetuate in the environment through sporadic/outbreak infections; however, they remain unidentified due to lack of easy and rapid diagnostic methods. While vaccine programme against group A rotavirus is being considered seriously, longitudinal surveillance of GBR in paediatric and adult cases of gastroenteritis would help determine their contribution to overall disease burden of diarrhoea in India.

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References

- Estes MK, Kapikian AZ. Rotaviruses. In: Knipe DM, Howley PM, Griffin DE, Lamb RA, Martin MA, Roizman B, Straus SE, editors. *Fields virology*, 5th ed Philadelphia: Lippincott, Williams & Wilkins; 2007. p. 1917-74.
- Hung T, Wang C, Fang Z, Chou Z, Chang X, Liang X, *et al*. Waterborne outbreak of rotavirus diarrhoea in adults in China caused by novel rotavirus. *Lancet* 1984; *1* : 1139-42.
- Fang ZY, Ye Q, Ho MS, Dong H, Qing S, Peneranda ME, *et al*. Investigation of an outbreak of adult diarrhea rotavirus in China. *J Infect Dis* 1989; *160* : 948-53.
- Krishnan T, Sen A, Choudhury JS, Das S, Naik TN, Bhattacharya SK. Emergence of adult diarrhoea rotavirus in Calcutta, India. *Lancet* 1999; *353* : 380-1.
- Sanekata T, Ahmed MU, Kader A, Taniguchi K, Kobayashi N. Human group B rotavirus infections cause severe diarrhea in children and adults in Bangladesh. *J Clin Microbiol* 2003; *41* : 2187-90.
- Kelkar SD, Zade JK. Group B rotaviruses similar to strain CAL-1 have been circulating in Western India since 1993. *Epidemiol Infect* 2004; *132* : 745-9.
- Aung TS, Kobayashi N, Nagashima S, Ghosh S, Aung MS, Oo KY, *et al*. Detection of group B rotavirus in an adult with acute gastroenteritis in Yangon, Myanmar. *J Med Virol* 2009; *81* : 1968-74.
- Kelkar SD, Zade JK, Dindokar AR, Dhale GS, Vaishya SS. Outbreak of diarrhoea in Daman and detection of group B rotavirus from three adult cases. *Natl Med J India* 2007; *20* : 41.
- Gouvea V, Allen JR, Glass RI, Fang ZY, Bremont M, Cohen J, *et al*. Detection of group B and C rotaviruses by polymerase chain reaction. *J Clin Microbiol* 1991; *29* : 519-23.