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Non-polio enterovirus association with acute and persistent diarrhea

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Non-polio enteroviruses (NPEVs) are ubiquitous and are associated with a variety of diseases in humans, especially infants and young children. Though majority of enteroviruses are transmitted by feco-oral route, and first replicate in the cells of gastrointestinal tissue, their role in diarrhea remained unexamined in majority of the epidemiological studies on diarrhea. Further, a causative agent in about 30-40% of diarrheal cases is yet to be understood. To conclusively determine the role of NPEVs in acute diarrhea, a five-year comparative molecular epidemiological investigation on non-polio enterovirus- and rotavirus-associated diarrhea in children in the age group of 0-9 years was conducted in Bangalore, India, during 2007-2012. This study surprisingly revealed that while NPEVs were associated with about 20% of diarrheal cases, rotavirus was detected in about 14%. The annual prevalence of NPEV and RV-associated diarrhea ranged between 8% and 22% during the study period. Enteroviruses were also associated with epidemics-like outbreaks during which, they were detected in up to 50% of diarrheic children. For the first time, this study demonstrated a contrasting seasonal prevalence between rotavirus diarrhea and NPEV-associated diarrhea, the former primarily occurring during winter months, and the latter predominating during non-winter seasons. Of 37 NPEV serotypes detected in diarrheic children, seven echovirus types 1, 7, 11, 13, 14, 30 and 33 were frequently detected, with types 11 and 30 being more prevalent. A follow-up study in children from birth up to two years of age further revealed NPEVs association with every persistent diarrheal episode, the viruses being detected for 14 days to 4 months. NPEV is the single most frequently and persistently detected pathogen among the agents that were examined. It was considered that majority of EV infections are asymptomatic and <1.0% infections cause disease. Our studies reveal that NPEVs are a major cause of gastrointestinal diseases, and NPEV-associated diarrhea is as significant as rotavirus diarrhea. There is an urgent need for detailed systematic investigations on NPEVs in gastrointestinal diseases.

Biography

Rao obtained his Ph.D. in 1982 from Indian Institute of Science, Bangalore and carried out post-doctoral studies in University of Alabama in Birmingham from 1982-1984 and at National Cancer Institute, NIH, Bethesda from 1984-1987. He joined as Assistant Professor in the Department of Microbiology & Cell Biology, Indian Institute of Science during the end of 1987. He is currently a Professor and served as chairman of the department. He is a member of several national committees of funding agencies and selection committees of several institutes. He is a Fellow of two reputed National Science Academies of India and is a recipient of a few National awards. Our work on rotavirus, clinical, translational and fundamental, is highly recognized, including large number of citations. He has published more than 50 publications in reputed international journals. Recent work on non-polio enteroviruses revealed, for the first time, several observations of great clinical significance.

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