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Epidemiology and Prevalence of Rotavirus Genotypes and Clinical Severity of Acute Gastroenteritis among Vaccinated and Unvaccinated Children in Telangana State, India

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ABSTRACT

Introduction: Rotavirus infection represents a significant global health burden, particularly among children under 5 years of age, with acute gastroenteritis (GE) being a leading cause of morbidity and mortality worldwide. Despite the availability of rotavirus vaccines such as Rotarix and Rotateq, the comprehensive efficacy of these vaccines against diverse rotavirus strains remains a subject of ongoing investigation. Understanding the epidemiology, prevalence of rotavirus genotypes, and clinical severity among vaccinated and unvaccinated children is crucial for informing public health interventions.

Materials and Methods: A prospective, cross-sectional study was conducted in Telangana state, India, spanning from 2013 to 2018. Stool samples and clinical data were collected from 1400 children hospitalized due to acute gastroenteritis in pediatric wards across Hyderabad. Samples were screened for rotavirus using ELISA and Reverse Transcription PCR methods. Children were stratified into vaccinated (n=458) and unvaccinated (n=892) cohorts based on their vaccination status. Disease severity was assessed using the vesikari scoring system. Genotyping of rotavirus strains was performed using established laboratory techniques.

Results: Significant differences in rotavirus prevalence were observed between vaccinated (16.8%) and unvaccinated (73.45%) cohorts, highlighting the protective efficacy of vaccination. Vaccinated children exhibited milder clinical manifestations, with fewer episodes of loose stools and vomiting, and less severe dehydration compared to unvaccinated children. Mortality attributable to rotavirus infection was exclusively observed among unvaccinated children. Age-stratified analysis revealed a significantly younger mean age among rotavirus-positive children in the vaccinated group. Seasonal variations in rotavirus prevalence were noted, with a peak incidence during the winter months. Genotyping analyses identified a diverse array of rotavirus genotypes circulating within the study population, with G1P8 and G2P4 emerging as predominant strains.

Conclusion: This study provides comprehensive insights into the epidemiology, clinical manifestations, and strain diversity of rotavirus infection among children in Telangana state, India. Rotavirus vaccination demonstrates notable efficacy in reducing disease burden and severity, underscoring the importance of vaccination programs. Ongoing surveillance and research efforts are imperative to address emerging challenges posed by strain diversity and to optimize immunization strategies for maximal public health impact.

Keywords: Rotavirus infection, Epidemiology, Genotypes, Mortality

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