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Rotavirus vaccination and disease severity and genotypic prevalence in vaccinated and unvaccinated children

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Introduction & Aim: Rotavirus is major cause of viral diarrhea in infants and young children worldwide. There are two rotavirus vaccines, Rotarix and Rotateq that were approved by global health agencies. However, these vaccines are not targeted to all reported serotypes and the prevention of recombinant strains is not justifiable. Thus, the present study was aimed to determine the genotypic prevalence of rotavirus infection and disease severity between vaccinated and unvaccinated children in Hyderabad region, India.

Materials & Methods: The stool samples and clinical data were collected from 731 children less than 5 years of age with acute gastroenteritis admitted to the pediatric ward during November 2013 to October 2015. The study was approved by Institutional ethical Board. Anthropometric and demographic data and vaccination history were collected from all the patients using structured pro forma and consent was taken from their parents/guardians. Patients with immuno-compromised state, metabolic disorders and congenital malformations were excluded. The samples were screened for routine bacterial, parasitic and fungal gastroenteritis. All the samples were screened for detection of Rotavirus using standard ELISA method and reverse transcriptase PCR.

Results: Of the total study group (n=731), 64.5% (n=472) were unvaccinated and 35.4% (n=259) were vaccinated. A 28.1% (n=133) of cases from unvaccinated and 16.9% (n=44) vaccinated group were found to be Rotavirus positive by ELISA method. A significant difference in disease severity was found between unvaccinated and vaccinated children, where 9-14 episodes of loose stools ($p<0.05$), 5-6 episodes of vomiting ($p<0.05$), moderate to severe dehydration and abdominal pain in unvaccinated children against, 6-7 episodes of loose stools ($p<0.05$), 2-3 episodes of vomiting ($p<0.05$), mild to no dehydration in vaccinated children. Viral diarrheal cases (22%) are more when compared to bacterial (9.83%), parasitic (1.4%), fungal diarrhea (0.2%) under 5 years of age. 5% of Rotavirus ELISA negative samples were found to be Rotavirus positive by RT-PCR method. Among unvaccinated the prevalent genotypes were (G1[P8]-26%), (G2[P4]-32%), (G1[P6]-7%), (G9[P6]-0.7%), (G9[P4]-1.5%), (G Untyped-9%), (P Untyped-11%), (Both Untyped-19%) and in vaccinated children prevalent genotypes were (G1[P6]-4%), (G2[P4]-3%), (G1P[8]-4%), (G9[P6]-2%), (G9[P11]-4%), (G12[P4]-2%), (G12[P6]-2%),(G Untyped-13%), (P Untyped-31%) and (Both Untyped-25%).

Conclusion: The prevalence and disease severity was significantly high in unvaccinated children. The detection of rotavirus in vaccinated children and un-typed G and P genotypes warrants the possibility of variant strains indicates the less efficacy of vaccination and further study is needed.

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