

Association of rotavirus strains and severity of gastroenteritis in Malawian children

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Background

Rotavirus is one of the major causes of severe gastroenteritis in under five children worldwide. Over 25% of diarrhoea-associated hospitalizations at Queen Elizabeth Central Hospital (QECH) in Malawi are associated with rotavirus infection. However, the relationship between disease severity and the infecting rotavirus strains is not known. We conducted a hospital-based surveillance study to examine the association of the circulating rotavirus strains with gastroenteritis severity in Malawian children.

Methodology

Stool samples were collected from infants who presented with diarrhoea at QECH between November 2011 and February 2019. Disease severity was determined using the Vesikari scores (0 – 5: mild, 6 – 10: moderate, 11 – 15: severe, and ≥ 16 : very severe). Presence of rotaviruses in stool samples was detected using Enzyme Immunoassay (Meridian Premier™ Rotaclone®). The rotavirus strains were genotyped using nested reverse transcription polymerase chain reaction.

Results

Rotaviruses were detected in 33% (n=866/2,596) of the collected stool samples. All rotaviruspositive samples were genotyped and 64% (n=554) of these had a single G and P genotype combination hence were used in the severity analysis. Those with mixed genotype infections (n=185 (21.36%)), partially typed (n=41(4.73%)) or rarely detected genotypes (n=86 (9.93%)) were excluded from further analysis. Among G1P[8] (n=170 (19.63%)) infections, 0(0%), 33(19.4%), 107(62.9%) and 30(17.6%) had mild, moderate, severe and very severe gastroenteritis, respectively. Among G2P[4] (n=198 (22.86%)) infections, 6(3.0%), 43(21.7%), 112(56.6%) and 37(18.7%) had mild, moderate, severe and very severe gastroenteritis, respectively. Among G2P[6] (n=85 (9.82%)) infections, 4(4.7%), 23(27.1%), 47(55.3%) and 11(12.9%) had mild, moderate, severe and very severe gastroenteritis, respectively. Among G12P[6] (n=67(7.74%)) infections, 0(0%), 6(9.0%), 49(73.1%) and 12(17.9%) had mild, moderate, severe and very severe gastroenteritis, respectively. Among G12P[8] (n=34 (3.93%)) infections, 0(0%), 5(14.7%), 26(76.5%) and 3(8.8%) had mild, moderate, severe and very severe gastroenteritis, respectively.

Conclusion

All frequently detected strains were associated with severe gastroenteritis but there was no direct relationship between the severity of gastroenteritis and specific infecting rotavirus strains.