

Diversity of Rotavirus Strains Circulating in Botswana before and after introduction of the Monovalent Rotavirus Vaccine

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Background

Globally, rotavirus is the leading cause of acute gastroenteritis (AGE) in children aged <5 years. Botswana introduced the monovalent rotavirus vaccine (Rotarix) in July 2012. To study the impact of this vaccine on rotavirus genotypes circulating in Botswana, a comparison of the genotypes pre-vaccination (2011-2012) and post-vaccination (2013-2018) periods was conducted.

Subjects and Methods

Residual samples from 284 children <5 years of age that tested positive for rotavirus by enzyme immunoassay were genotyped. One hundred and five samples were from the pre-vaccination period and 179 were from the post-vaccination period. Genotyping was performed using two multiplexed one-step reverse transcription polymerase chain reaction (RT-PCR) assays for the amplification and genotyping of rotavirus VP7 (G) and VP4 (P) genes.

Results

Prior to vaccine introduction, the predominant rotavirus circulating genotypes were G9P[8] (n=63, 60%) and G1P[8] (n=22, 21%). In the post vaccination period, G2P[4] was the predominant genotype (n=49, 28%), followed by G9P[8] (n=40, 22%) and G1P[8] (n=33, 18.5%). There was a significant decline in the prevalence of G9P[8] (p=0.001) in the post-vaccination period. There was also a notable decline in G1P[8]. A spike in G2P[4] was observed in 2013, one year post-vaccine introduction. Rotavirus strain G3P[4] (n=8) was only detected in the post-vaccine introduction period. In 2018 there was a marked increase in genotype G3P[8] (p=0.0003).

Conclusions

The distribution of circulating rotavirus genotypes in Botswana changed after vaccine implementation. Further studies are needed to examine whether these changes are related to vaccination or simply represent natural secular variation.