

Pre-Vaccine Rotavirus diarrhoea Disease trends in Enugu South East Nigeria 2011-2018

Tagbo BN^{1,2}, Mwenda J.M³, Chukwubuike C⁴, Benjamin-Puja C⁴, Azubuike C⁴, Armah G⁵, Mapaseka SL⁶, Mphahlele JM⁶, Isiaka A⁷, Namadi L⁸, Yusuf KM⁸, Okafor HU^{1,2}, Ozumba UC⁴, Nnani RO¹, Okafor V¹.

¹Institute of Child Health, University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu State, Nigeria

² Department of Paediatrics, University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu State, Nigeria

³WHO African Regional Office, Brazzaville, Congo

⁴Department of Microbiology, University of Nigeria Teaching Hospital, Ituku-Ozalla, Enugu State

⁵Electron Microscopy Department, Noguchi Memorial Institute for Medical Research, University of Ghana, Legon, Ghana

⁶South African Medical Research Council/Diarrhoeal Pathogens Research Unit, Department of Virology, Sefako Makgatho Health Sciences University, Medunsa, Pretoria, South Africa

⁷World Health Organization Country Office, Abuja Nigeria

⁸National Primary Health Care Development Agency, Federal Ministry of Health, Abuja, Nigeria

Background

Diarrhoeal diseases are a leading infectious cause of global under five mortality most of which are attributed to Rotavirus. Rotavirus is the commonest cause of severe dehydrating diarrhoea in under five children worldwide. It is estimated to cause 215,000 deaths annually. More than 80% of rotavirus deaths occur in developing countries. To reduce the burden of the diseases, many African countries have introduced RV vaccine into their national immunization schedule. Nigeria government intended to introduce RV vaccine into its RI schedule by 3rd quarter of 2019 but this could not be achieved as it was shifted to year 2020.

We set out to document the Rotavirus disease burden in the country prior to Rotavirus vaccine introduction to further demonstrate the significance of early introduction of the RV vaccine, use the local data for advocacy; also to document pre-vaccine introduction baseline data to enable post introduction vaccine impact assessment and to contribute to global data as well as document locally circulating strains.

Methods

Using the WHO standard case report forms and case definition, eligible children aged less than 5 years hospitalized in participating sentinel surveillance hospitals were enrolled into the study from 2011 to 2018. Demographic and clinical data were collected and stool samples were collected mostly within 48 hours of admission to exclude nosocomial infection. Samples were tested in the sentinel surveillance hospital laboratory for Rotavirus using ELISA method. Children were followed up until discharged; and then the outcomes were recorded in the case report forms. Data were analyzed and results presented in tables and charts.

Results

From January 2011 to Dec 2018, a total of 3,558 children were enrolled into the study. A total of 1,668 were rotavirus positive giving a positivity of 47%. Among the rotavirus positive cases, there were 981 males with a male to female ratio of 1:1.4. A total of 1088 cases (65%) were less than 12 months old; 479 (29%) were aged 12-23 months while 101 (6%) were aged ≥ 24 months. Therefore, a total of 1,567 (94%) were aged ≤ 2 years old. Most of the cases occurred during the cold dry season (December to April).

Significantly more children with rotavirus positive diarrhea had vomiting ($p < 0.0001$) and received ORS/IVF ($p < 0.0001$) compared to children with rotavirus negative diarrhea. The case fatality was 1.1%.

Conclusion

Rotavirus associated diarrhoea among under five children was high with marked seasonality in the population studied. Nigeria is set to introduce Rotavirus Vaccine in 2020, data so far generated will help government in policy formulation. This nine year data provides a robust pre-vaccine introduction data against which vaccine impact could be assessed after is introduced. This will equally inform policy makers on the disease trends and the way forward.

Keywords: Hospitalization; Rotavirus; under 5 children; Nigeria; vaccine.