Prevalence of Rotavirus and enteric pathogens among pediatric in patients at Katutura Hospital in Namibia

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Abstract

Background: Diarrheal disease ranks third in the global estimates for mortality in children < 5 years. In Namibia diarrhea disease contributes 3% of these deaths. Data on the pathogens associated with diarrhea disease in the country is currently unavailable.

Method: From February 2015 through June 2015, stool samples were collected from a total of one hundred and forty two patients who attended the Katutura State Hospital, Windhoek, Namibia for acute diarrhea. We used the Seeplex Ace diarrhea panels for detection of viruses and bacteria in the samples by PCR.

Results: Out of the 142 samples, viral pathogens accounted for 37(26.0%) while bacterial pathogens accounted for 77 (54.2%).Of the 37 cases of viral diarrhea the following were obtained for each pathogen: Norovirus GI, 1 (2.7%), Astrovirus, 4(10.8%) Rota, 8 (21.6%), Adenovirus, 11 (29.7%), Norovirus GII, 13 (35.1%). The prevalent bacterial pathogens were E coli H7, 17 (22.0%), Salmonella, 16 (20.8%), VTECH, 12 (15.6%), Y enterocolitica, 9(11.7%), Aeromonas, 8 (10.4%) and C perfringens, 8 (10.4%).Multiple infections were present in 27 out of the 142 children (19.0%). The overall median age of the children was 12 months while those with multiple infections had a median age of 10 months.

Conclusion: The study identified Noro virus GII, Adenovirus and Rota virus as the prevalent viral pathogens seen at the Katutura State Hospital in Windhoek Namibia.

Introduction

- Diarrhoea ranks second to respiratory illness in Namibia for an infection related cause of morbidity and mortality in children <9 years
- Globally, diarrhoea kills 1 out of nine children which is more than the effect of Malaria, HIV and TB combined
- Key mitigation efforts involve rotavirus vaccination which was started in 2014 in Namibia by the Ministry of Health and Social Services (MOHSS), Namibia. These efforts while helpful in diminishing rotavirus related illness, impact from other pathogens may be limited.
- There is currently no report on the pathogens involved in acute diarrhea in children <9 years in Namibia
- The aim of the study was to determine the prevalence of **Rotavirus and bacterial enteric pathogens in children with acute diarrhoea reporting at the Katutura State hospital in Windhoek, Namibia.**

Methods

- 142 samples (stool) from children aged < 5 y/o at gastrointestinal unit of Katutura Hospital were collected with flocked swabs
- Samples were stored frozen at -80°C.
- DNA/RNA was extracted using Seeprep Stool kit on the Seeplex automated platform
- Pathogen detection was by nested and RTPCR for bacteria and viral pathogens respectively, following the manufacturers instructions
- PCR amplicons were resolved in 1.5% EtBr stained agarose gels and viewed with UV light.
- QPCR for detection of specific plasmodium species was carried out with abTES™ Malaria 5 qPCR II Kit.

Results

Fig. 1 Agarose gels showing (A) Bacterial pathogens (B) Viral pathogens from stool samples: lane 1 marker DNA.; PC=positive controls

Table 1 Results summary of stool pathogens in children < 5 y/o

Pathogens	Prevalence
Viral	26.2%
NorovirusG1	2.7%
Astrovirus	10.8%
Rota virus	21.6%
Adenovirus	29.7%
NorovirusGII	35.1%
Bacterial	54.2%
E. coli H7	22.0%
Salmonella	20.8%
VTECH	15.6%
Y enterocolitica	11.7
Aeromonas	10.4%
C. perfringens	10.4%
Demographics	
Overall median age of the children	12 months
Median age of those with infections	10 months
None of the children had received rotavirus vaccination	

Fig. 3 Map indicating the locations of Windhoek where the Katutura Hospital is sited.in Namibia.

Discussion

- We have identified *viral and bacterial pathogens associated with acute diarrheal disease in children < 5 y/o at the Katutura State Hospital in Namibia for the first time.*
- The top three viral pathogens were: *Norovirus GII, Adenovirus, and Rotavirus*; while the top three bacterial pathogens were: *E coli H7, Salmonella and VTECH*
- Infections were largely in children 10 months old
- While Rotavirus vaccination has been shown to reduce the burden of acute diarrhea significantly in a number of sub-Saharan African countries, the impact on bacterial pathogens is not well established.
- The absence of any viable vaccine against moderate to severe diarrheal due to bacterial pathogens means that key alternatives will be education and prevention.

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