ABSTRACT

A total of 784 faecal samples collected during the 7 months period, January to July 2010 from children under 5 years old with diarrhoea who were admitted at the 3 referral hospitals; Parirenyatwa Hospital, Harare Hospital and Chitungwiza hospital, were tested for presence of rotavirus antigen using enzyme immune-assay (EIA). Fifty faecal samples from children without diarrhoea were also tested for rotavirus antigen. Sixteen (32 %) of 50 non-diarrhoeal samples and 515 (65.7 %) diarrhoea samples were rotavirus positive. The association between diarrhoea and detection of rotavirus in faecal samples was statistically significant with an overall odds ratio of diarrhoea patients of 4.08 ($p<0.0001$). The rotavirus diarrhoea prevalence (59.4 %) was high in children ≤ 18 months old diarrhoea patients. The high prevalence of rotavirus diarrhoea was found during the dry cool season in diarrhoea patients < 59 months of age. Fifty rotavirus positive isolates from diarrhoea patients were genotyped using reverse-transcription polymerase chain reaction. A large proportion of samples could not be genotyped; 28.6 % did not produce G genotype result, and 43.2 % did not produce P genotype result. Of the strains that could be genotyped, G9 (24.3 %) was more predominant, followed by G2 (10.9 %), and P[6] (31 %) was more predominant followed by P[4] (14.3 %. The G and P combinations which were more predominant were G1P[6], G9P[6] and G8/G12P[4]. The RNA electrophoresis of the rotavirus genome was performed on 30 rotavirus positive samples, 90 % produced migration patterns typical of the group A rotavirus: 70.4 % were long electropherotypes and 22.2 % were short electropherotypes. The identification of unusual P and G combinations in Zimbabwe may affect the efficacy of currently available rotavirus vaccine formulations and may contribute to the design and development of a broadly reactive rotavirus vaccine for use in African countries.

DEDICATION

I dedicate this work to my family who allowed me to spend all my spare time on the project.

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LIST OF ABBREVIATIONS

-	-	negative or minus
%	-	Percent
/	-	and
+	-	positive or plus
<	-	greater than
<	-	less than
≤	-	less than or equal to
≥	-	greater than or equal to
°C	-	degrees Celsius
µl	-	microlitres
AFP	-	Acute Flaccid Paralysis
AFRO	-	Africa
AgNO3	-	Silver nitrate
AMP	-	adenine monophosphate pump
BDS	-	Bachelor of Dental Surgery
bp	-	base pair
BSc	-	Bachelor of Science
CDC	-	Centers for Disease Control and Prevention (USA)
cDNA	-	complementary deoxy-ribose nucleic acid
Cl	-	Chloride
Conc	-	concentration
DNA	-	Deoxy-ribose nucleic acid

DPRU	-	Diarrhoeal Pathogens Research Unity
EIA	-	Enzyme immuno-assay
ELISA	-	enzyme-linked immunoassay
el al	-	and colleagues
EPI	-	Expanded Programme on Immunization
H1N1	-	An influenza type A strain (Swine flu)
HBMLS	-	Bachelor of medical laboratory sciences honours
L	-	long electropherotype
Ltd	-	limited
MBChB	-	Bachelor of medicine and bachelor of surgery
mg	-	milligrams
MOHCW	-	Ministry of Health and Child Welfare
MRC	-	Medical Research Council
Msc	-	Master of Science
Na	-	sodium
n	-	number
nm	-	nanometers
No.	-	number
NSP	-	non-structural viral protein
NT	-	non-typeable
OD	-	optical density
PAGE	-	Polyacrylamide gel electrophoresis
QA	-	Quality assurance

QC	-	Quality control
RT-PCR	-	reverse-transcriptase polymerase chain reaction
S	-	short electropherotype
SGLT1	-	Sodium glucose co-transporter 1
SOP	-	Standard operating procedure
TAE	-	Tris-acetic acid-EDTA buffer
TBE	-	Tris-borate EDTA buffer
TM	-	Trade Mark
UK	-	United Kingdom
UV	-	ultra-violet
VP	-	viral protein
VP4	-	P antigenic protein
VP7	-	G antigenic protein
WHO	-	World Health Organization