DETECTION AND CHARACTERIZATION OF ROTAVIRUSES ASSOCIATED WITH DIARRHOEA IN BUFFALO CALVES IN SRI LANKA

by

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Abstract

175 buffalo faecal samples from 139 diarrhoeic and 36 non-diarrhoeic calves in Sri Lanka were screened by the ELISA (Enzyme Linked Immunosorbent Assay) for group A rotavirus antigen. 13 diarrhoeic samples and one non-diarrhoeic sample were positive for this antigen. To characterize and compare buffalo strains of group A rotaviruses with those of cattle calf strains of these viruses, 57 faecal samples from cattle calves located in Sri Lankan farms with diarrhoea or in contact with such diarrhoeic calves too were screened by the ELISA. Fifty-one of them were from diarrhoeic and 6 were from non-diarrhoeic calves. Of 57 samples screened, five samples from diarrhoeic calves were positive for group A rotavirus antigen. Twenty three stool samples which were positive for group A rotaviruses and 5 group A rotavirus negative stool samples from Sri Lankan children with diarrhoea were also studied to compare the human strains of rotaviruses with those of buffalo and cattle strains detected in Sri Lanka.

Samples which were positive for group A antigen were further subgrouped by the ELISA using monoclonal antibodies for subgroups I and II antigen. 14 buffalo and 4 bovine group A strains were subgrouped as subgroup I. Of the 23 human group A strains two were subgrouped as belonging to subgroup I, and 14 to subgroup II. Seven of the human strains could not be subgrouped. Sixteen strains of buffalo calf group A rotaviruses, which included five group A rotavirus strains which had been previously subgrouped, and bovine group A strains were also serotyped directly from the clinical samples by the ELISA using monoclonals prepared against G_6 and G_{10} serotypes. Five of the buffalo strains were of the G_6 serospecificity, whilst 4 strains were of the G_{10} serospecificity. One of four cattle calf strain belonged to the G_{10} serotype, whilst the other 3 strains did not react with the reagent used. None of the human strains were

serotyped as G_6 or G_{10}. This is the first record of serotyping of buffalo and calf strains of rotaviruses in Sri Lanka.

SDS-PAGE (Sodium Dodecyl Sulfate-Polyacrylamide Gel Electrophoresis) was used to screen 175 buffalo, 57 cattle, and 23 human faecal samples to detect atypical rotavirus genomic RNA banding patterns and to compare electropherotypes of group A buffalo, cattle and human rotaviruses. By this technique long electrophoretic dsRNA banding patterns were observed for the buffalo, bovine and human group A rotavirus strains. Further analysis of electropherograms and by co-electrophoresis 7 and 3 different electropherotypes were observed for buffalo and human group A strains respectively. For the bovine group A rotavirus strains a single electropherotype was observed. During the period of study, diversity of electropherotypes of buffalo group A rotavirus strains was observed for the population studied. For group A rotaviruses, variation of electropherotypes was observed in interspecies as well as intraspecies. This is the first record of such studies done in Sri Lanka. Although rotavirus strains of different antigenic groups were not discovered from clinical samples of buffalo and cattle by SDS-PAGE, a rotavirus strain with atypical genomic RNA banding pattern was discovered from human diarrhoeic faecal samples which was negative for group A rotavirus antigen. By analyzing genomic RNA banding pattern of this strain and comparing it with the banding pattern of reference group C swine strain, the electropherotype was identified as belonging to group C. Further, by co-electrophoresis, differences of electropherotypes were too observed for human atypical and pig reference group C rotavirus strains.