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"Prevalence of Rotavirus Associated Diarrhea with Non-Viral Infectious Diarrhea in Different Age Groups:

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Introduction

Diarrheal disease is a major cause of morbidity and mortality worldwide and it remains a major public health challenge especially in developing countries. It is the second most common cause of death among children less than five worldwide.[1,2] Diarrhea is usually a symptom of an infection in the intestinal tract which can be caused by a variety of bacterial, viral and parasitic. Diarrhea due to infection is widespread throughout developing countries.[3]

Annually, around 4.6 million deaths and approximately 25–30% of all deaths among children below five, can be due to acute gastroenteritis. Each year, an estimated 2.5 billion cases of diarrheal disease occur worldwide among children and estimates suggest that overall incidence has remained relatively stable over the past two decades. More than half of these cases are in Africa and South Asia, where bouts of diarrhea are more likely to result in death or other severe outcomes.[4]

The annual mortality associated with gastroenteritis has been estimated to be 0.8 to 2 millions globally and 300,000 in India.[3] There are many causes of infectious diarrhea, which include viruses, bacteria and parasites. The collective data from worldwide studies reported most common etiological agents of diarrhea among

all ages in decreasing order of prevalence includes ***Rotavirus,*** **Diarrheagenic *E.coli*(DEC),** ***Shigella species,*** ***Campylobacter*** **spp.,** ***Vibrio cholerae,*** and **nontyphoidal** ***Salmonella*.**6 Other important viral agents of diarrhea are **Norwalk and Adenovirus** whereas ***Cryptosporidium***, ***Entamoebahistolytica*** and ***Giardiaintestinalis*** are common among parasites.[1,2,4]

Viral pathogens like Rotavirus, Norovirus, Astrovirus, Sapovirus, and Adenovirus have been associated with AGE, which represent more than 75% etiological agents of AGE. Globally, Rotaviral Gastro Enteritis (RVGE) causes about 611,000 childhood deaths annually.[5]

As the morbidity due to diarrheal diseases remains constant, it adds up to the global burden of diseases. However, there is a dearth of the information available about epidemiology of diarrheal diseases from developing countries like India, especially from rural population.

Material and methods

This cross sectional study study was carried out in the Department of Microbiology SANTOSH MEDICAL COLLEGE & HOSPITAL SANTOSH UNIVERSITY, GHAZIABAD, on different age of patient, both symptomatic and asymptomatic who reported to the microbiology laboratory of Santosh Hospital during September 2019 to February 2020. 60 stool samples were collected of children less than 5 years and more than 5 years and processed in microbiology laboratory of Santosh Hospital, Ghaziabad.About 15-20 ml of stool specimen was collected in a sterile wide Mouthed leak proof plastic container during acute stage of gastroenteritis (<3 days of onset of symptoms) After the collection stool Samples were kept in ice box to maintain ideal temperature (2-80 C) and transported immediately to the Microbiology diagnostic laboratory.

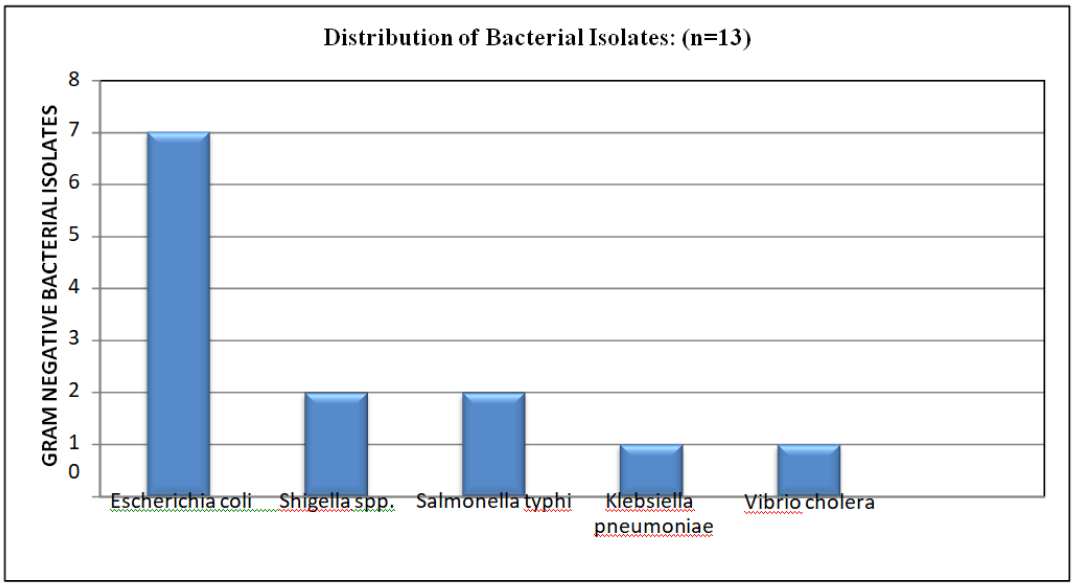
Faecal sample were subjected to macroscopic examination and microscopic examination for colour consistency and atypical components like mucus, blood and parasites. They were further subjected to microscopic examination by saline and iodine wet mount for RBCs, leucocytes, and parasitic ova &cyst.

Results

Of the 60 diarrheal patients in the age group of 0 to 50 years having acute gastroenteritis, male patients were 37 (61.66%) while female patients were 23(38.33%). Maximum cases of Acute gastroenteritis (AGE) were found between the age groups of 0 to 5 years of age and minimum no. of cases were found of 20-30 years.

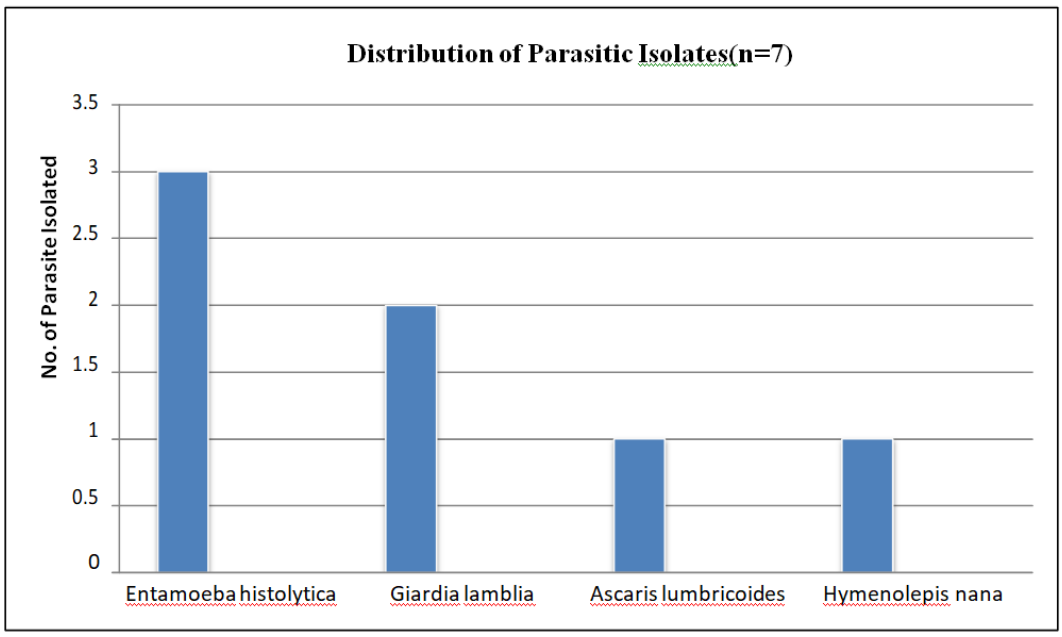
Of the 60 samples found 7 (11.66%) isolates were for Escherichia coli of which 2 (3.33%) as Shigella spp. 2(3.33%) as Salmonella typhi, 1 (1.66%) as Klebsiella pneumoniae, while only 1 (1.66%) was isolates Vibrio cholera.

Table 1: **Distribution of Various Bacterial Isolates.**



Of the 7 (11.66%) samples which were found in different parasites Entamoeba histolytica 3 (5%), Giardia lamblia 2 (3.33%), Ascaris lumbricoides 1 (1.66%), Hymenolepsis nana 1 (1.66%).

Table 2: **Distributions of Different Parasitic Isolates.**



The prevalence of rotavirus was found 46% and Non-rotavirus microorganism (bacteria and parasites) was 54% out of which 36% bacterial organism and 18% were parasites.

Discussion

Diarrheal disease continues to be an important cause of morbidity and mortality throughout the world, especially in developing countries. where mortality rate due to infectious diarrhea could be as high as 56%.7 Children and young adults are the most affected, particularly in regions with limited resources and where hygienic measures are not strictly followed.[8]

Among bacterial agents for AGE in India, it has shown that 58.9% of children suffering from diarrhea are caused by Salmonella typhi, Shigella Spp. and Entero-pathogenic E.coli. Diarrhea genic Escherichia coli which represents a leading cause of paediatric diarrhea while Shigella spp. causes 164.7 million cases of diarrhea of which 163.2 million occur in developing countries with 1.1 million deaths each year worldwide mostly in developing countries.[9]

In the present study it was observed that most of the positive cases were seen during October to february month. There were more occurrences during winter months as these months promote survival of Rotavirus infection in children. Here infection was present throughout months but higher incidence occurred during winter months, and this corresponds to a study conducted by Sheriff et al.[10]

Rotavirus infection was mostly seen between age group 1 to 2 years ; similar age distribution was also found by Rajiv Bahl et al.[11] Rotavirus infections in large numbers were observed in rural population and this could be due to vaccination, health awareness and hygiene conditions. In temperate climates Rotavirus gastroenteritis has higher prevalence during winter month [10]

Here rotavirus vaccination may have a positive impact on the course of disease involving other gastrointestinal pathogens, preventing potential exacerbations and providing benefits to the individual and society as a whole. Rotavirus infections sometimes occur as coinfections with other microorganisms, including viruses, bacteria, and parasite. In vitro, animal and clinical studies provide evidence for potentiation between rotavirus infection and coinfecting pathogens. The mechanisms of such interactions are not well studied.

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