



CLINICO-EPIDEMIOLOGY OF ACUTE DIARRHOEA IN CHILDREN IN PORT BLAIR, SOUTH ANDAMAN DISTRICT -A HOSPITAL-BASED STUDY.

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ABSTRACT **Background:** Acute diarrhoea is one of the major causes of childhood morbidity and mortality, especially in children below five in developing countries. Diarrhoea can be caused by a variety of microorganisms through faecal-oral contamination. Factors for enhancing diarrhoeal infections are lack of health education, unaccess to safe water, poor sanitation & hygiene practices and unsafe human waste disposal. **Objective:** an epidemiological study of acute diarrhoea in children visiting private/hospitals and PHCs in Port Blair, south Andaman. Both in-patient (I.P) & out-patient (O.P) were included in the study for the sample collection. **Methodology:** A cross-sectional study was done during 2019- 2022 on 349 children up to 14 yrs. Data was collected using proforma children and parents (esp. Mothers) were enrolled on those children who were too young to be interviewed regarding their personal hygiene and habits. **Results:** The study was conducted from September 2018 to June 2022, a total of 349 cases were screened, suffering from a diarrhoeal infection from an urban area, of which 57.87% were males and 42.12% were females. The maximum was infants & 1-year-old children and the minimum were school children, the majority were reported in the month of October-December, March, and April & and the least in other months, economic status in South Andaman is average middle-class therefore economically they are stable and therefore socio-economic status is of least concern. While practicing hand washing parents & children are found to have less or poor knowledge and unsatisfactory access to cooking and drinking water. No mortality was seen in the study. Health education on preventive measures for diarrhoea was given to the community while taking the proforma and by visiting Anganwadi. **Conclusions:** proper hygiene & sanitization are the most basic practice followed by the ingestion of unsafe drinking water with implicit health education among people, regarding appropriate feeding (complimentary/breast), clean and safe surroundings and immunization may prune the burden of diarrhoea among these children.

KEYWORDS :

INTRODUCTION

Definition:

Diarrhoea is the passage of three or more loose or liquid stools per day or more frequent passage than is normal for the individual (WHO) change in consistency and character of stools with or without the presence of mucous and blood which can last from several days to weeks leaving the body without the water and salts, that are necessary for survival. Diarrhoeal disease is the 2nd leading disease globally and 3rd leading disease in India, Globally, there are nearly 1.7 billion cases of childhood diarrhoeal disease and estimated 5,25,000 deaths occur each year among children under five years of age.^[1] Around 370,000 were pumelled to death in 2019 (WHO). Young children use more water in a day due to their higher metabolic rates (UNICEF, WHO) and are more prone to death as they are unable to conserve the water balance in their body as they have small kidneys, in comparison to adults, inability to conserve water content in their body, leaving them mild or severely dehydrated during diarrhoeal infection.^[2] Numerous studies are escorted on diarrhoea which shows evidence of geographic demography in clinico-epidemiological profiles of diarrhoeal disease, reasons are endemicity of diarrhoeal diseases, degree of infection, pathogenic variance, living styles & behaviour pattern for access to water, sanitation, faeco-oral contamination, eating habits, growing population and the immoderate management. Treatment & management when given is either abused or underutilized by the parents or guardian in the case of small children. The present study of clinic-epidemiological presentations of diarrhoeal infection was carried out & conducted at children's hospitals (Chirayyu Child Care, INHS Dhanvantri Hospital, Port Blair Andaman child & Nicobar Island) in Port Blair (South Andaman).

METHODOLOGY

It was a cross-sectional descriptive study conducted in hospital settings from September 2018- June 2022. All the diarrhoeal patients who visited the children's hospitals were included in the study.

Inclusion Criteria: (a) Children of all age groups with complaints of diarrhoea (b) patients/patient's guardians willing to participate in the study.

Exclusion criteria: patients/patient's guardians unwilling to participate. Data was collected using proforma designed with preferred questions. Immunization, parents could barely recall the

vaccine status of the child, nor they had any immunization proper card available except for some. All the children were examined clinically for the presence of signs of nutritional deficiency according to weight, age and height and other morbidities at the time of evaluation, and accordingly, Children were treated with ORS and/or antibiotics suffering from the diarrhoeal infection.

Sample size: A total of 349 children from new-born to schools going off the urban area were involved, based on population.

Study area: There are two seasonal courses one is rainy that lasts for 6- 7 months that is usually rainy and the other is summer, summer part of the year begins in mid-November and lasts for 5 months, that ends in mid-April and has clear weather, and the February clearest month considered, the cloudier month begins around mid-April and lasts for approx 6-7 months ending by November, and the cloudiest month of the year is July, during which 95% of the sky is overclouded.^[4]

RESULTS

Table 1: Month and year-wise distribution of the study population

S.R. NO.	MONTH	NO. OF CASES	%	YEAR	NO. OF CASES	%
1	JANUARY	29	8.30%	2018	54	15.47%
2	FEBRUARY	30	8.59%	2019	96	27.50%
3	MARCH	45	12.89%	2020	33	9.45%
4	APRIL	49	14.04%	2021	117	33.52%
5	MAY	39	11.10%	2022	49	14.04%
6	JUNE	5	1.40%			
7	JULY	0	0%			
8	AUGUST	3	0.85%			
9	SEPTEMBER	11	3.15%			
10	OCTOBER	35	10.02%			
11	NOVEMBER	40	11.46%			
12	DECEMBER	63	18.05%			
	TOTAL	349			349	

Month-wise distribution: A total of 349 patients were included in the study, in table 1, it is observed that patients experience diarrhoea more in October-December & in April with 10%- 14% infection rates, and

less in January- March with 0%-3% rates of diarrhoeal infection, since the area of Port Blair usually has rainfall throughout the year, but mostly in the month June-September, the city experiences moderate to heavy rainfall, during this time barely any cases of diarrhoea has been registered, as it embarks the season of flu, the cases increases from October and soars during December to March, due to the (a) festive season (b) visit of tourists during this time is high.

The year-wise distribution gives a peck in the variation, the least cases were recorded in the year 2020, only 33 cases i.e., 9.45 %, as it was the dynamic year where the world has fallen in the annihilation of the pandemic and the maximum cases 117 out of 349 i.e., 33.52% in the year 2021, despite the advertisements & promotions of maintenance of hygiene & sanitisation followed by 2019 with the no. of cases reported was 96 i.e. 27.50%, the average cases were recorded in the year 2018 with 54 cases, but during this year the study was started but still it flourishes the diarrhoeal as 54 cases i.e., 15.47%, making it a second most year as the sample was collected from September to December.

Table 2: Age-wise distribution

SR.NO.	MONTH	NO. OF CASES	%
1	NB	1	0.28%
2	IN	71	20.34%
3	1Y	102	29.22%
4	2Y	61	17.47%
5	3Y	36	10.31%
6	4Y	13	3.72%
7	5Y	22	6.30%
8	6Y	10	2.86%
9	7Y	9	2.57%
10	8Y	8	2.29%
11	9Y	4	1.14%
12	10Y	5	1.43%
13	11Y	4	1.14%
14	12Y	1	0.28%
15	13Y	1	0.28%
16	14Y	1	0.28%
	TOTAL	349	

NB-new born; IN- infant; Y-year/yearsAge plays a pivot role during the evaluation of distribution as children under five years are more susceptible to the severe complications of diarrhoeal infection, and gives the objective of mortality & morbidity rate.

The maximal age which was found during the study was 1-year children with 102 cases out of 349 i.e., bagging 29.22% followed by infants with 71 cases that sacks 20.34%, thereafter 2-5 years the cases are high, whereas it is seen from the table that as the age increases there is a remarkable decrease in the cases 10- 14 years with as low as 4 cases recorded in the three years of study.

Males were registered more in number than females barging with 202 (57.87%) & 147(42.12%) respectively.

The maximum number of cases subjected more were out-patient (O.P) than in-patient (I.P) i.e., 203 & 146 respectively, which manifests that the severity of the infection has decreased over the past years, performed in the previous analysis.

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Table 4: Distribution based on the severity of infection

SR.NO	SEVERITY OF DEHYDRATION	NO OF CASES	%
1	NO DEHYDRATION	262	75.07%
2	MODERATE DEHYDRATION	70	20.05%
3	MILD DEHYDRATION	12	3.43%
4	SEVERE DEHYDRATION	5	1.43%
	TOTAL	349	

Table 5: relation between the quality of drinking water and diarrhoea.

HOUSEHOLD MEASURES(DRINKING)		%
AQUAGUARD	25	7.16%
RO WATER	27	7.73%
BOILING	81	23.20%
CHLORINATED WATER	10	2.80%
CANNED BOTTLE	46	13.10%
CANDLE FILTRATION (STEEL)	148	42.40%
DIRECT FROM TAP	12	3.43%
	TOTAL	349

For drinking purposes, the majority 148(42.40%) in Port Blair use candle filtration /chalk filtration, boiling water is the utmost practice after filtration 81 (23.20%) followed by utilization of canned bottles i.e., 46 (13.10%) cases, aquaguard (without electricity) and RO is the minimal used by 25 & 27 cases respectively, in some house, that they do not use any filtration method but use it either directly from the tap (3.43%) or chlorine (2.70%) is given in the water. During the interview, parents/ guardians stated that they only boil water for children, those who use water direct from the tap or use chlorine in the water. Boiling is also not according to the prescribed method, rather they boil only for 5 mins.

Toilet hygiene and hand hygiene maintenance are found very low among the cases, about two-fifths of cases do not handwash before cooking and eating 232 (66.4%) and the rest 117 are included as occasional handwash, toilet hygiene maintenance is even less.

In-patients were treated with ORS, IV fluids, antibiotics, probiotics and zinc supplementation. Whereas the out-patients were treated only with antibiotics, probiotics, and zinc supplements.

DISCUSSION

This is a cross-sectional study based on hospital settings, carried out for 3 years from September 2018- June 2022 on 349 all-age group children, for the evaluation of clinico-epidemiology to figure out the acute diarrhoeal infection performed in the private children's hospitals, in South Andaman. The number of cases has shown the patients arriving due to diarrhoea, but somehow the case variations were directly affected due to the pandemic of COVID-19 and the cases were slacked during the following year of lockdown after global emergence was declared. However, in the current study, it is seen that Male patients outnumbered the female patient,

The patients usually had a good economic condition, but what lacks behind is education, about 2/3 patients' guardians had formal education, and the literacy rate in Port Blair is 83.63% according to the census 2011-2022 with the change of 5.33% [5] the given census shows the basic education they had was enough to be aware of prevention, a similar study by Raghuvan.P.Ramya et al [6] had reported 1354 cases between 2013-2016, the diminished figure in present times was observed concerning increase in the literacy rate

The results showed the patients with acute diarrhoea in this study were a source of water supply from a municipal corporation using a pipe (water stores in utensils, sometimes covered or uncovered) well & pond, poor maintenance of toilet hygiene as they were reluctant to use proper source for washing hands. Probable no. of diarrhoeal cases was consequently increased due to the use of piped water, in a similar study Lechtenfeld T. et al analysed, the structural correlation of water

pollution between households which are connected to the same water pipe supply, study further states the menacing of health due to the polluted water in most of the urban areas in Africa and Middle East where they have limited supply & resources of water.[7] 5The majority of patients reported the duration of diarrhoea as 24- 48 hrs before visiting the hospital or getting admitted to it.

In the current study, it was seen that the frequency of diarrhoea is highly variable i.e., 4-8 stools/ 24 hrs were noted in 225 cases (64.46%), while 70 cases (20.05%) had >10 stools/ 12, while rest 47(13.4%) patients had mixed frequencies observed. A similar study by Srivastava k et al affirms that 37.27 & had >10 stools/ day in 26 %-36% had passed 3- 5 stools/ day.[6]

In this study, it is observed that 258 (73.92%) patients had experienced only watery diarrhoea and 46(13.18%) cases complained of watery diarrhoea along with mucous with a tinge green colour due to the presence of bile in it. Bloody diarrhoea along with mucous was found in 14(4.01%) cases, whereas 31(8.88%) had semi-formed stool before the hospitalization but went on to have watery loose stools after a day or two, Talan D et al in their study found majority with blood in stools and these were imposed for enteric bacteria esp. *Escherichia coli*. [7] Also, De et al in their study remarked that only 5.4% of cases had diarrhoea with mucous and blood, and about 22% of them had an epidemiological history of eating and drinking outside or family had a similar illness in the past 2 months, in our study the cases was observed for the history of contacts as 35.05% a past week or recent infection in the family/ neighbourhood, rest 65.04% claimed not confirmed or not contact history, [8] another study found by Srivastava K et al, that 36.36% of the patients had similar complaints of loose motions in the last 2 months. [6]

A current study reveals that in-patient (I.P) presented with the complications like fever (mostly presented) convulsions, UTI, tonsillitis, anaemia, typhoid & dengue were observed in 27(7.73%) of 349 patients and acute diarrhoea in 242(69.34%) cases. Whilst the other 20 patients were observed with recurrent, chronic/persistent and faulty feeding proportionately. A significant difference was found between in-patient & out-patients, 8(2.30%) in-patients had diarrhoea as nosocomial infection i.e., they came with a different health issue but was contradicted with diarrhoea along with mild dehydration. Non-frequent loose stools (NFLS) are one such condition, where 18 (5.15%) patient was brought with NFLS initially but then had diarrhoea after 2-3 days. On the other hand, out-patients visited either with re-infection or with acute diarrhoea, with or without dehydration & without hitch. Zero mortality rate was interposed in this study.

In a similar study, Srivastava et al observed that dehydration was found in 79.8% of cases (mild in 27.7%, moderate in 29.09% and severe in 22.72%). [6] In Mumbai study De et al in their study observed moderate dehydration with diarrhoea in 53 patients (57.6%), 32 had severe dehydration with diarrhoea (34.8%) and seven had mild dehydration with diarrhoea (7.6%). [8] Another study by Joshi CK et al found that 46.2% of children suffered moderate dehydration and 35.4% mild dehydration [11] 9 and Gascon J et al in their case study on diarrhoea procured dehydration in 11 out of 103 cases. [10] In our study, 0% of mortality was seen and patients were completely rehabilitated. Fule RP et al In the hospital-based study, conducted in Solapur out of 233 patients with diarrhoea, it was observed that none of the patients died even during an epidemic. [11] In a similar study, Tejaswani et al, states a similar condition of the good outcome with no mortality, verifying equals the case as more dehydration more stirring of death case and less dehydration, less death, no dehydration and no death. [12] The consequences are due to the impact of early medication and doctor's discretion, non-dehydration, appropriate treatment and proper management.

CONCLUSION

It is a well-known fact that childhood diarrhoea is a nightmare to some families since they lost their children at a tender age, while others were fortunate as they initiated the treatment early phase of infection. All the parents /guardians should probably understand the emergence of the illness. Risk factors that exhibit the infections are hygiene, proper disposal of faeces, use of pipe water for cooking & drinking, and proper storage of water. If stored in utensils it should be covered, use filter water for cooking if not possible, boiling is a must, and this is the least must be done. During the study was carried out there were several guardians who were reluctant to cooperate as soon as the patient

recovered this implies the nature of ignorance in parents. However, a small approach was taken to educate the people regarding health, personal hygiene and sanitation during the interview and by visiting Anganwadi.

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