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Original Article

Frequency of Sepsis in Diarrheal Adults and Their Outcome in a Urban Hospital

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Abstract

Objective: Aim of this study to describe factors associated with sepsis in diarrheal adults and to see clinical and laboratory profile of those patients as well as to see outcome of sepsis in diarrheal patients.

Methodology: This was observational prospective study done among 200 diarrheal patients admitted in an urban hospital from June 2019 to February 2020.

Results: Among 200 adult diarrheal patients, 67.5% were male, 32.5% were female and 44.44% male and 53.58% female subsequently developed features of the sepsis. Hyponatremia (75%) and Hypokalemia (65%) was the commonly observed electrolytic imbalance and 55% of respondent developed AKI. Prior antibiotic use, systematic steroid intake and presence of co-morbidity were most significant risk factors for development of sepsis.

Conclusion: Diarrheal adults who had history of steroid intake for long, prior antibiotic use and who had multiple co-morbidities are in high risk to develop sepsis.

Keywords: Sepsis, Diarrhea, Acute Kidney Injury (AKI)

Introduction

Diarrhea is a global problem. Diarrhea was the eighth leading cause of mortality, responsible for more than 1.6 million deaths as reported in 2016. More than a quarter (26.93%) of diarrheal deaths occurred among children younger than 5 years, and about 90% (89.37%) of diarrheal deaths occurred in South Asia and sub-Saharan Africa.[1] There is evidence that clearly shows that diarrheal disease disproportionately affects locations with poor access to health care, safe water, and sanitation, and low-income or marginalized populations.[2] This also means that although challenges exist, diarrhea mortality is largely avoidable. Renewed efforts to reduce disease burden are urgently needed.

An inequitable proportion of diarrhea morbidity and mortality occurs in low-income countries, which have fewer resources and less robust infrastructure to manage burden compared to high-income countries.[3] Hence, the global health community has made prevention and treatment of diarrheal diseases a priority to alleviate this burden.

Patients typically present with features of sepsis evident by infection, tachycardia, fever, and leukocytosis. Progression of sepsis resulting in hypotension and/or absent peripheral pulsesfrom poor peripheral perfusion in the absence of dehydration is termed severe sepsis.[4,5] Unresponsiveness to isotonic fluid (30 ml/kg bolus of normal saline/ ringer's lactate over 10-15min) and require the support of inotropes/ vasopressors, is termed as septic shock. Oliguria,acute kidney injury, and altered mental status signify the presence of organ dysfunction.[6] Diarrheal pathogens may translocate from gut to blood stream and cause sepsis. Several literatures presented this diarrhea, sepsis interplay mostly in children from Bangladesh.[7,8] Following SSC recommendation, we administer the first antibiotic early which helps to reducein-hospital mortality.[9]

Methodology

Prospective observational study was conducted at Dhaka National Medical College Hospital from June-2019 to February-2020.

In this study, we included 200 diarrheal patients aged >=18 years who were hospitalized with or without features of sepsis. We had excluded patients having cardiogenic shock and hospital acquired severe sepsis. Infection or presumed presence of infection plus tachycardia plus hyperthermia (>=38°5°C) or hypothermia (<=35.0°C) or abnormal white blood cell numbers are the criteria of sepsis.[10,11]

A combination of sepsis and poor peripheral perfusion evident by hypotension and/or absent peripheral pulses without dehydration constituted severe sepsis.[10] Data was collected using structural questionnaire at the day of admission as well as in every follow up in next successive days up to discharge of patients. Data was processed and analyzed with the help of computer program SPSS version 20.

Results

Total number of patient or N=200

Figure-I: Gender distribution of study population.

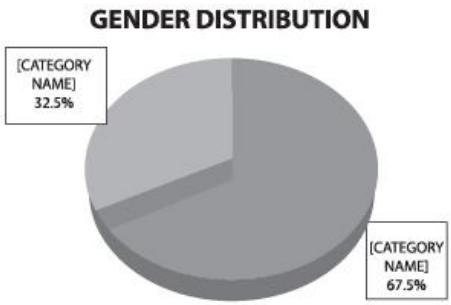

Table-I: Age Distribution Patients

	Sepsis				p-value
	Male- 135		Male- 135		
Age Group	Total No.	%	Total No.	%	
20-30	12	8.88%	4	6.15%	
30-39	28	20.74%	17	26.15%	
40-49	39	28.88%	10	15.38%	
50-59	30	22.22%	23	35.38%	<.005
60-69	11	8.15%	7	10.76%	
70-79	10	7.40%	4	6..15%	
80 Above	5	3.70%	3	4.62%	

Table-II: Frequency of sepsis in 200 diarrhea patients and gender distribution.

	Sepsis			
	YES		NO	
	Total No.	%	Total No.	%
Male (135)	60	44.44%	75	55.56%
Female (65)	35	53.85%	30	46.15%

Laboratory Characteristics of Diarrheal patient, n=200

Table-III: Laboratory Characteristics of Diarrheal patient

	No of Patients	%
Raised leucocyte count	95	47.50%
Hyponatremia	150	75.00%
Hypokalemia	130	65.00%
Hypocalcemia	80	40.00%
Hypomagnesaemia	70	35.00%
AKI	110	55.00%

Table-IV: Clinical characteristics of diarrheal patients

	Sepsis				p-value
	YES- 95		NO- 105		
Characteristics	Total No.	%	Total No.	%	
Complains of fever	80	84.21%	25	23.81%	<.005
Prior antibiotic use	45	47.37%	23	21.90%	
Systemic steroid intake	25	26.32%	20	19.05%	
Co-morbidity	64	67.37%	36	34.29%	
Dehydration	90	94.74%	84	80.00%	
Pneumonia	9	9.47%	4	3.81%	
Hypoxemia	5	5.26%	0	0.00%	
Referral	4	4.21%	0	0.00%	

Discussion

In this study, we studied diarrheal adults to explore clinical and laboratory factors associated with sepsis. Male predominancy was observed among hospitalized diarrheal patients (67.5%) in maximum study related with diarrheal disease in adult shows maximum hospitalized patients were male.[4,5] Tendency to development of sepsis is more common among hospitalized female diarrheal patients (53.84%). This data is corresponding with study of River et all where he mentioned late hospitalization and initial negligence of female diarrheal patients may be responsible for this kind of results.[12]

In this study among 200 hospitalized diarrheal patients, 75% developed hyponatremia and 65% of patient developed hypokalemia. This data closely matched with study of Schmidt et all.[13] Incidence of AKI was observed among 55% of respondents which is very high in comparison to study done by Baleon et all[14] where incidence of AKI was 25% which may be due to lack of knowledge of patients about rehydration during diarrheal illness.

Among the clinical characteristics, dehydration was the commonly observed clinical features. 94.74% among the sepsis patients and 80% among the non-sepsis patients, fever was the second commonly observed clinical features. 88.89% among the sepsis patients and 24.76% among the non-sepsis patient. These data are closely related to study done by Jones et all.[15]

Sepsis rate was significantly high among the diarrheal patients who previously has history of antibiotic use, systemic steroids intake and those who had multiple co-morbidities. These factors were mentioned as a risk factor of sepsis in study performed by Waljee AK et all.[16]

In our study, we referred 4% of patients of diarrhea who developed features of severe sepsisas we donot have facilities to manage this type of critically ill patients.

Conclusion

Our study suggests, sepsis is common in diarrheal adults and rate of progression from sepsis to severe sepsis and septic shock is around 4.2%. Hyponatremia and hypokalemia are the commonly observed electrolyte incidence. Systematic steroids intake, prior antibiotic use, presence of co-morbidity was independently associated with sepsis in diarrheal patients. In developing country like Bangladesh, proper history taking, rigorous follow-up and early identification of organ dysfunction are essential for a better outcome.

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