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A Study on Renal Failure in Gastroenteritis

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ABSTRACT
Acute gastroenteritis is one among the important cause of preventable Acute kidney injury (AKI).
Acute kidney injury is rapid deterioration of kidney function associated with increased mortality.
Inadequate or delayed restoration of diarrheal losses result in very high incidence of AKI .
Sepsis and diarrhea leading to hypovolemia are risk factors for AKI.There should be increased focus on on early detection and better management of AKI associated with gastroenteritis to prevent further worsening of clinical outcome.
KEYWORD: Renal failure ,acute kiney injury ,gastroenteritis ,acute tubular necrosis

AIMS AND OBJECTIVE

- To study the clinical profile of patients with Acute renal failure(ARF) following gastroenteritis.
- To study the outcome of prompt rehydration and treatment in patient with ARF due to gastroenteritis.
- To analyze the laboratory parameters in patients with ARF following gastroenteritis.
- To corelate clinical features and laboratory parameters with outcome of ARF.

I. INTRODUCTION

Acute kidney injury (AKI) is defined as sudden deterioration of kidney filtration and excretory function over days to weeks resulting in the retention of nitrogenous and other waste product.

Criteria for diagnosing renal failure:
Increase in serum creatine (S.Cr) with or without reduction in urine volume from the time of admission.
No previous history of chronic kidney disease.

MECHANISM
Prerenal(40-80%)-marked reduction in renal perfusion pressure below the autoregulatory range lead to abrupt decrease in GFR and and ARF
Intrinsic (20-50%) – most common being ATN ,predisposing factor for ATN is renal ischaemia due to prolonged prerenal azotemia, especially septic shock

	Pre Renal AKI	ATN
Urinalysis	Normal	Trace to 1+albumin Casts- Muddy brown Epithelial &WBC& Eosinophils
BUN/Creatinine	>20:1	<10:1
Urine Sodium	<20meq	>40meq
Urine PH	Acidic	Alkaline
Urine Specific Gravity	1.020 – 1.030	1.010
Fe Na	<1%	>2%
Urine Osmolality	700-800mosm	300 mosm

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GASTROENTERITIS

Gastroenteritis is defined as diarrhoeal disease that may be accompanied by nausea ,vomiting or abdominal pain.

Mechanism of ARF in GE

Preerenal azotemia- reduced intravascular volume——›reduction in GFR

Acute tubular necrosis-sustained prerenal azotemia due to prolonged hypovolemia.

Septicemia in GE secondary to gram negative organisms can cause DIC which may cause ARF as a consequence of thrombosis that is thought to occur in microvascular circulation acute cortical necrosis.

MATERIALS AND METHODS

Study design : prospective observational study.

Study Setting: Tertiary Care Hospital, GGH,Kakinada

Study Period: 6 Months (March 2022 to August 2022)

Sample Size: 60 patients who developed Acute Kidney injury following Gastroenteritis who are admitted to department of general Medicine

Inclusion criteria: All patients of either sex diagnosed to have AKI due to gastroenteritis.

Exclusion criteria: All patients diagnosed to have AKI due to cause other than GE.

Detailed history and clinical profile was recorded with laboratory parameters such as Renal function test, CBC, stool examination,electrolytes

The clinical and laboratory parameters were analysed to assess the role of each of these factors as possible outcome (Recovery/ Death).

II. RESULTS

TABLE 1: CATEGORY OF AKI

GROUP	DISTRIBUTION
Pre Renal	28(47%)
ATN	32(53%)

TABLE 2 :AGE AND SEX DISTRIBUTION

AGE	MALE	FEMALE	TOTAL
21-30	5	4	9(15%)
31-40	6	6	12(20%)
41-50	10	4	14(23%)
51-60	10	5	15(25%)
>60	7	3	10(16%)

Table 3: Duration of diarrhoea in relation with type of AKI

CATEGORY	DURATION OF DIARRHOEA	
	Less than 5 days	≥ 5 days
Overall patients	38 (63%)	22 (36%)
Pre Renal AKI	18 (47.5%)	11 (50%)
ATN	20 (52.5%)	11 (50%)
Survivors	32 (64%)	18 (36%)
Non survivors	7 (70%)	3 (30%)

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Table 4: Urinary output at time of admission

CATEGORY7	Total patients	Survivors	Death
Anuria	10 (16.6%)	7 (70%)	3 (30%)
Oliguria	43 (71.6%)	36 (83%)	7 (16%)
Non oliguria	7 (11.6%)	7 (100%)	

TABLE 5– Mean creatinine level

CREATININE (MEAN)	OVERALL PATIENTS	PRERENAL	ATN	SURVIVORS	NON SURVIVORS
BASELINE	4.09±2.81	3.86±1.82	4.2±2.13	5.05±2.52	4.7±2.13
PEAK	5.6±2.67	5.01±2.15	6.4±2.62	5.95±1.62	5.1±2.81
AT TIME OF DISCHARGE	2.8±1.15	1.36±1.02	3.60±1.23		

Creatinine at the time of admission ranged from 1.2 mg/dl to 20 mg/dl.

Table 6 -Mean urea level

Blood urea	Overall patients	Survivors
Baseline	154.0±70.52	143.26±71.2
peak	180.0±61.5	182.0±53.5
At time of discharge	101.5±38.6	

Urea level at of admission ranged from 32 mg /dl to 401mg

TABLE 7 :Mode of treatment

	Prerenal	ATN
No of patients	28	32
Conservative treatment	28	11
Hemodialysis		21

TABLE 8 Complication in AKI secondary to GE

Complications	
septicemia	11
Paralytic ileus	2
Uremic encephalopathy	8
Pulmonary edema	2
pneumonia	6

III. CONCLUSION

- Among 60 patients prospectively studied 46.6% of the patient had prerenal azotemia,53.3% of patient had Acute tubular necrosis.
- Oliguria was seen in 71.6% of patients, Anuria in 16.6%,while 11.6% of the patients were non oliguric.
- Male patients were more compared to females ,as they were more exposed to contaminated food and sanitary condition during the course of occupation .
- The most common electrolyte abnormality noted was hypokalemia in 83% of patients. Mean potassium value 4.59± 3.82
- The interval between onset of gastroenteritis and development of ARF nearly equal in prerenal and ATN groups
- Septicemia was the commonest complication, Out of 10 patients 7 with septicemia expired.
- Hemodialysis was done in 21 patients.
- Management consisted of fluid-replacement,correction of electrolyte abnormalities, administration of appropriate antibiotics.
- ARF following gastroenteritis differs from other causes of ARF by frequent occurrence of hypokalemia and has a better prognosis.

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