ORIGINAL ARTICLE

Frequency of Acute Renal Failure (ARF) in Patients of Liver Cirrhosis Presented with Hemetemesis and/or Melena

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ABSTRACT

Background: Patients with liver cirrhosis commonly present with renal dysfunction due to decreased clearance of free water with the end result of sodium and water retention[1]. Acute renal failure is particularly common in patients of liver cirrhosis who present with hemetemesis and/or melena, leading to bad prognosis in these patients.[2]
Aim: To determine the frequency of acute Renal Failure(ARF) in patients of liver cirrhosis presented with hemetemesis and /or melena.
Methods: ThisDescriptive Case Series study was done in Medicine Department, Services Hospital Lahore. A total of 128 patients of liver cirrhosis who presented with hemetemesis and /or melena were enrolled. Serum creatinine levels were assessed and abdominal ultrasound with particular emphasis on kidney, ureter and bladder (K.U.B) examination was also done. Liver disease was assessed for severity by Child-Pugh scores. Patients having Acute renal failure were treated as per hospital protocol.Data was analyzed by using SPSS version 23.0. Data were stratified for age, gender and child-pugh class to deal with effect modifiers. After stratification, Chi-Square test was used, taking p-value ≤0.05 as significant.
Results: Frequency of Acute renal failure (ARF)in patients of liver cirrhosis presented with hemetemesis and/melena was 82(64.1%). Significant association of Acute Renal failure with Child-Pugh Class was also noted.
Conclusion: Acute Renal Failure is a common findingin patients with liver cirrhosis presented with hemetemesis and/or melena, the occurrence of which is mainly related to the severity of upper gastrointestinal bleeding and baseline liver function.
Key words: Acute renal failure, chronic liver disease, Hemetemesis, Melena.

INTRODUCTION

Patients with liver cirrhosis commonly present with renal dysfunction due to decreased clearance of free water with the end result of sodium and water retention [1].Acute Renal failure is particularly common in patients of liver cirrhosis who present with hemetemesis and/or melena leading to bad prognosis in these patients[2].

Many precipitatingfactorsof Acute renal failure in patients of liver cirrhosis have been noticed especially upper gastrointestinal bleed leading to hypovolemic shock, spontaneous bacterial peritonitis, large-volume ascitic fluid drainage ,and certain drugs i.e. angiotensin converting enzyme inhibitors, non-steroidal anti-inflammatory drugs, quinolones & aminoglycosides[3].

Despite the increased prevalence of upper gastrointestinal bleeding in patients of liver cirrhosis, no studyhave so far been done to evaluate the association between upper gastrointestinal bleeding and Acute renal failure in liver cirrhosis.[4] Several factors related with upper gastrointestinal bleeding may lead to worsening ofrenal function. First, the reduced intravascular volume caused by the blood loss may cause decreasedrenal perfusion which may result ina reducedglomerular filtration rate.[5]Second, renal function may also be adversely affected by bacterial infections, which develop frequently in the setting of upper gastrointestinal bleeding[6].

Finally, it has been proposed thatin patients without liver disease, small losses of blood volume will not cause enough reduction in renal perfusion.But in patients with advanced liver cirrhosis in whom effective arterial blood pressure is already reduced ,even small loss of blood volume will result in significant reduction in renal perfusion which may trigger development of hepatorenal syndrome[7].

Acute renal failure commonly presents as a complication of liver cirrhosis, particularly associated with acute-on-chronic liver failure, which occurs in up to 50% of admitted patients of livercirrhosis.[8]

The increased prevalence of Acute Renal failure is due to a reducedeffective arterial blood volume due to arterial vasodilation, increase invasoconstriction in intrarenal vessels and ineffective renal auto regulation that leadsto renal failure, along with many contributing factors associated with liver cirrhosis likeupper gastrointestinal bleed, bacterial infections and large volume paracentesis.[9]

In a study, it was reported that, Acute renal failure was notedin 107(70%) patients .Acute renal failure with Chronic renal failure was observed in 26 people (17%), and isolated Chronic renal failure was noted in 19 people (13%). Prerenal acute kidney injury was the most prevalent cause of Acute renal failure (69%). The mortality rate was 31%, with the highest mortality observed in patients of hepatorenal syndrome, was 79%. The presence of hemetemesis and melena, septicemia, and Hepatorenal syndrome showed high mortality[13].

MATERIALS AND METHODS

The study was done in Medicine Department, Services HospitalLahore. In this descriptive case series study,128 patients of liver cirrhosis presented with hemetemesis and /or melenawere included. The sample size of 128 was estimated by using 95% confidence level, 8% margin of

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error with an expected percentage of acute Renal failure 70% in patients with upper gastrointestinal bleeding.[13]

Inclusion Criteria

1. Patients of both gender.
2. Patients ages between 16-60 years.
3. Patients presented with Hemetemesis and /melena(episode during last 12 hours).
4. Known cases of liver cirrhosis for at least 6 months.

Exclusion Criteria

1. Patients with any co-morbid disease (Diabetes Mellitus.BSR >200mg/dl), (Hypertension. BP >160/90 mmHg).
2. Patients with acute viral hepatitis.
3. Patients with chronic renal failure (GFR <30ml/kg/hr).

After taking written informed consent from all patients of chronic liver disease presented with hemetemesis and/or melena were enrolled. Demographic information (including name, age, gender, duration of cirrhosis) was also recorded.

Patients underwent physical examinationand ultrasound abdomen especially Kidney, ureter and bladder(KUB) examination . Serum Creatinine levels were assessed on theadmission and then after 48 hours.Serum creatinine ≥50% from baseline assessed after 48 hours of admission was considered as Acute Kidney injury.

Patients with hemetemesis or melenadue toesophageal varices were givenintravenous infusion ofoctreotideand then endoscopic variceal band ligation was done. Patients with actively bleeding peptic ulcer or fundal variceswere managed by injecting sclerosing agents, and then treated with continuous infusion of omeprazole for five days. Severity of liver cirrhosis was assessed by Child-Pugh scores. Patients having ARF were addressed according to hospital protocol.

Data was analyzed by using SPSS version 23.0. Frequencies and percentages were notedfor qualitative variables e.g. gender, Acute Renal failure and child-pugh class. Quantitative variables e.g. age and creatinine levels (at baseline and after 48 hours) were expressed by Mean±S.D. Data were stratified for age, gender and child-pugh class to deal with effect modifiers. After stratification, Chi-Square test was used, taking p-value ≤0.05 as significant.

RESULTS

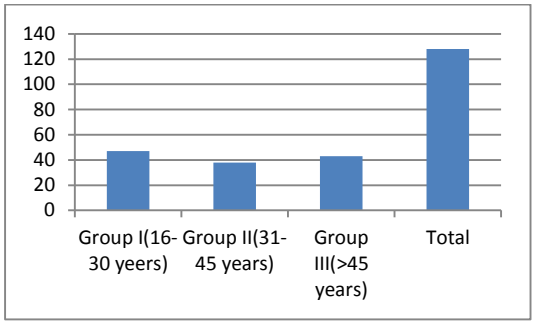
A total of 128 patients of liver cirrhosis presented with hemetemesis and /or melena were enrolled to determine frequency of Acute Renal failure.

I. Age distribution of the patients was done and three groups were made,group I(age 16-30 years),group II(age 31-45 years) andgroupIII(age>45 years).Age distribution of patients showed that 47 patientswere in age groupI ,38 were in age groupII and 43 were in age groupIII.

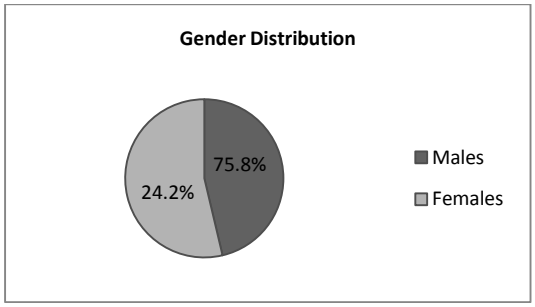
Table-2: Frequency distribution of Acute renal failure

Acute renal failure	Frequency	Percentage
Yes	82	64.1%
No	46	35.9%
Total	128	100.0%

Age Distribution

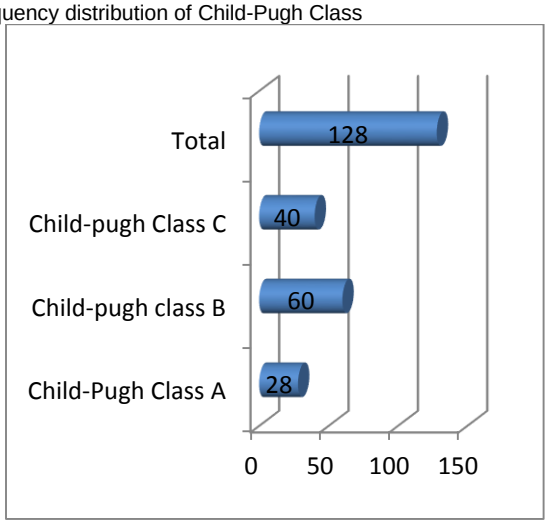


II. Gender distribution of patients was done which showed that 97(75.8%) were males and 31(4.2%) were females.



III. Distribution of patients according to the child-pugh class was done which showed 28 patients were found with class-A followed by 60with class-B and 40 with class-C.

Frequency distribution of Child-Pugh Class



IV. Frequency distribution of Acute Renal failure was done which showed that 82(64.1%) had ARF and 46(35.9%) had no ARF

V. Stratification of ARF with age was done which showed that ARF was 32(68.1%) in age group I(16-30 years), 23(60.5%) in age groupie (31-45 years) and 27(62.5%) in age group III(>45 years). Insignificant relation between age of patients and ARF was noted i.e., p=0.753.

Table-3: Stratification of acute renal failure with respect to age

Age Groups	Acute renal failure		Total	p-value
	Yes	No		
Group I (16-30 years)	32	15	47	0.753
	68.1%	31.9%	100.0%	
Group II (31-45 years)	23	15	38	
	60.5%	39.5%	100.0%	
Group III (>45 years)	27	16	43	
	62.8%	37.2%	100.0%	
Total	82	46	128	
	64.1%	35.9%	100.0%	

VI. Stratification of ARF with gender was done which showed that ARF was noted in 61(62.9%) male patient and 21(67.7%) female patients. Insignificant association of ARF with gender was noted i.e., p=0.624 .

Table-4: Stratification of acute renal failure with respect to gender

Gender	Acute renal failure		Total	p-value
	Yes	No		
Male	61	36	97	0.624
	62.9%	37.1%	100.0%	
Female	21	10	31	
	67.7%	32.3%	100.0%	
Total	82	46	128	
	64.1%	35.9%	100.0%	

VII. Stratification of ARF with respect to child-pugh class was done which showed that ARF was found in 11(39.3%) patients with class-A, 31(51.7%) with class-B and 40(100%) with class-C. Statistically significantassociation of child-Pugh class with ARF was notedi.e.P=0.000

Table-5: Stratification of acute renal failure with respect to child-pugh class

Child-Pugh Class	AcuteRenal failure		Total	p-value
	Yes	No		
A	11	17	28	0.000
	39.3%	60.7%	100.0%	
B	31	29	60	
	51.7%	48.3%	100.0%	
C	40	0	40	
	100.0%	0.0%	100.0%	
Total	82	46	128	
	64.1%	35.9%	100.0%	

DISCUSSION

Although the significance of Acute Renal failure in the assessment of patients with liver cirrhosis has already been demonstrated in several recent studies[15-18] but the clinical features ,morbidity and mortality of Acute renal failure in patients of liver cirrhosis presented with hemetemesis and /or melenahas not particularly been studied.

The main findings of the present study are that Acute renal failure is a relatively prevalent finding in these patients, particularly in the case of a severe bleeding episode and advanced liver cirrhosis (*i.e.*, Child-Pugh class C), shows that it is associated with very bad prognosis.

The incidence ofAcute renal failure increases in the elderly persons because of the increase inthe incidence of accompanying diseases and various structural and functional changes in aging kidneys (decreased renal blood circulation, decreased GFR, decreased total renal mass, glomerulosclerosis and thinning in the basal glomerular membrane)[18-19].

In this study, Total 128 patients of liver cirrhosis were selected for this study (Mean age of the patients was 37.9±13.1 years).Acute renal failure was noted in 82 (64.1%) patients. Total 97 (75.8%) were males and 31 (24.2%) were females. Significant association ofAcute renal failuewith Child-Pugh Class was noted.

Upper gastrointestinal bleed(UGIB) with renal failure in cirrhotic patients is quite common.[10] studiesalso indicatethat the prevalence of UGIB in patients ofend stage renal disease may be more as compared tothat in the general population.[11]In a study it has been estimated that in patients with end stage renal disease,upper gastrointestinal bleed led to 3 to 7 % of all deaths in these patients[12].

In another casereport, it was observed that, the Acute renal failure was notedin 107 patients (70%). Acute renal failure with Chronic Kidney Disease was noted in 26 individuals (17%), and isolated Chronic Kidney Diseasewas noted in 19 individuals (13%). Prerenal acute kidney injury was the most frequent cause of Acute renal failure (69%). The mortality ratewas 31%, with the highest mortality observed in patients of hepatorenal syndrome, was 79%. The evidence of hemetemesis and melena, septicemia, and Hepatorenal syndrome showed high mortality[13].

CONCLUSION

Acute renal failure is a common findingin patients with liver cirrhosis presented with hemetemesis and/or melena, the occurrence of which is mainly related to the severity of upper gastrointestinal bleedsand baseline liver function.

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