

Etiology and the Outcome of Hospital Acquired Acute Renal Failure (HAARF)

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ABSTRACT

Aim: To determine the etiology and the outcome of patients with hospital acquired acute renal failure

Rationale of study: High incidence of hospital acquired acute renal failure (HAARF) and substantial morbidity and mortality prompted to assess the determinants and outcome of the problem in our setup.

Place and duration of study: Medical Unit-II, Sheikh Zayed Medical College/Hospital, Rahim Yar Khan. From January to September 2013

Sample size: sample size is 107 patients.

Sample technique: Patients of ARF admitted in hospital that developed ARF in hospital setting.

Results: The mean±SD age of the patients was 48.12±3.28 years ranging from 19.6-59.4 years and the median age was 40.36 years. Out of 107 patients, 65(61%) patients were males and 42(39%) females.

Conclusion: Hospital acquired acute renal failure most commonly occurred in more than 40 yrs age group of patients. Mortality rate among HAARF patients was 50 (47%) patients, and full recovery occurred in 53 (57%) cases

Keywords: Acute renal Failure (ARF), Hospital acquired acute renal failure (HAARF) Hospitality

INTRODUCTION

Acute renal failure is a syndrome characterized by rapid decline in glomerular filtration rate (hours to days), retention of nitrogenous waste products, disturbance of extracellular fluid volume, electrolyte and acid base hemostasis¹.

Acute renal failure is a common condition in hospitalized patients. During past 10 years, the number of patients being diagnosed as having acute renal failure is increasing. The major causes of Acute Renal Failure in Hospital settings are Gastroenteritis, Abruptio Placentae, Postoperative Eclampsia and drug induced. Medical causes of ARF are almost; volume depletion and Sepsis is also common. Mortality and morbidity is high in patients with hospital acquired acute renal failure (HAARF).

The percentage of oliguria, multiple organ failure, systemic inflammatory response syndrome and use of mechanical ventilations are significantly high in hospital acquired acute renal failure (HAARF) than in community acquired acute renal failure (CAARF). Acute renal failure occurs in our society is due to mismanaged obstetrical/gynecological or surgical problems, hot humid environment, infections, drugs, poisoning and partially treated medical cause².

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PATIENTS AND METHODS

This Descriptive case-series study was conducted in Medical Unit II, dialysis Unit, Surgery Department, Obstetrical Gynecology and Intensive Care Unit, Sheikh Zayed hospital Rahim Yar Khan from January to October 2013. Proportion of sepsis=6%,⁴ confidence interval 95%, margin of error 4.5% and sample size is 107. Patients of ARF admitted in hospital that developed ARF in hospital setting

Patients of either gender above 18 years and below 60 years of age with clinical diagnosis of hospital acquired acute renal failure (HAARF), known Hypertensive and diabetic but normal renal function before admission of hospital were included in the study. Patients with acute or chronic renal failure, renal transplant, hepatorenal syndrome and cardiorenal syndrome were excluded from the study.

Data Collection Procedure: Informed consent for inclusion in the study was requested from admitted patients who developed hospital acquired acute renal failure having age between 18 to less than 60 years. To evaluate the etiology and outcome history was taken, clinical examination, investigations such as CBC, urine C/E, serum electrolytes and ultrasonography abdomen, was done to label the etiology and outcome.

Data Analysis: Data was entered using software SPSS version 16. Descriptive statistics was used to calculate mean±SD for age. Frequencies and percentages were calculated for gender, educational status and economic status, etiological factors and

outcome in terms of complete recovery and death. Stratification was done with respect to age, gender, educational status and economic status and chi square test was applied. P value less than or equal to 0.05 was taken as significant.

RESULTS

The present study was conducted in the Department of Medical Unit II and Dialysis Unit. 107 patients admitted to Sheikh Zayed hospital Rahim Yar Khan between the periods from January 2013 to October 2013. The findings and observation were recorded as below. The mean±SD age of the patients was 48.12±3.28 years ranging from 19.6-59.4 years and the median age was 40.36 years as shown on (Table 1). Out of 107 patients, 65(61%) patients were males, and 42(39%) patients were females. Male predominance was present as shown on (Figure-1). The age distribution of classification showed that more number of patients were in the age groups more than 40 Years i.e., 30(28.07%) and 35(32.71%) respectively (Fig. 1). The distribution of monthly income of the patients of (HAARF) in (Table 2). 36(33.64%) belong to low class Poor (family monthly income ≤Rs. 10,000, 48(44.85%) belong to middle class (monthly income Rs. 10,000-25000 RS.) and only 23(21.49%) belong to upper middle class (monthly income >Rs. 25,000). Out of 107 patients 25(23.4%) were illiterate, 30(28%) were Middle, 28(26.2%) were Metric, 14(13.1%) were Intermediate and remaining 10(8.4%) were Graduate (Fig. 3). Mortality rate among HAARF patients was 50(47%) patients, and full recovery occurred in 53(57%) cases (Fig. V). Most 45(42.05%) of the cases had Volume depletion etiology as the causative risk factor followed by sepsis 40(37.38%), Post-operative ARF and acute tabular necrosis is 7(6.54%) & 15(4.03%). Most common cause of HAARF was Volume depletion etiology followed by SEPSIS (Table-III). 65(60.7%). Majority of the patients has followed in the age groups >40 Years (Figure VI). The comparison association between gender distribution with outcome we found the majority of the cases were in recovery portion i.e., 50(46.7%), but which has the highest mortality 35(32.71%) in female patients but in all gender distribution the mortality rate 50(46.7%). The above finding showed the mortality in HAARF was significantly associated with gender distribution (P=0.000*). The majority of the cases of recovery were >40 years age group, but which had the highest mortality 38 (35.5%), but in both age groups the mortality being was around 50%. The above findings showed the mortality in HAARF was

significantly associated with age. The comparison of economic status with outcome variable the maximum patients had recovered conditions 24(22.4%), out of which 24(22.4%) poor patient had expired and 24 (22.4%). These findings were statistically not significant. However co morbid conditions are associated with poor patients out of HAARF. (P-value 0.504). The Highest Mortality rate among HAARF patients was 19(17.8%) & 13(12.1%) are those patients who had Middle & Metric education. HAARF was significantly associated with education status (0.000*)

Table 1: Descriptive statistics of HAARF (n=107)

Variable of study	Age
n=	107
Mean	48.12
Median	40.36
St. deviation	3.28
Minimum	19.6
Maximum	59.4
Range	56.12

Fig. 1: Gender distribution

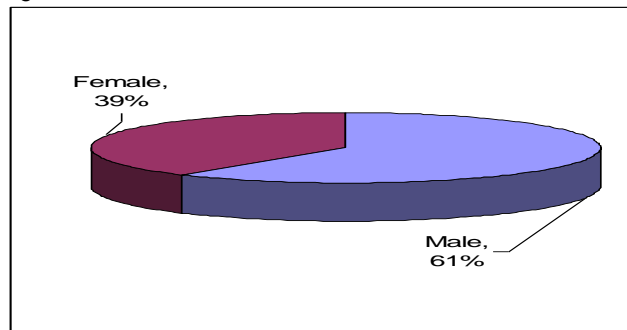


Fig. 3: Education status

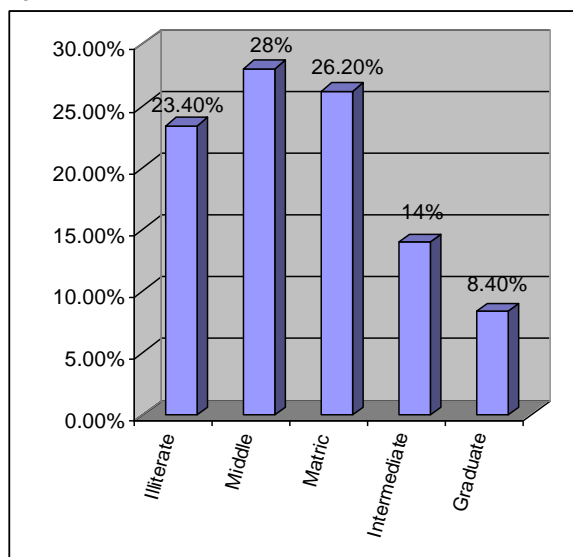


Fig. 2: Age groups distribution

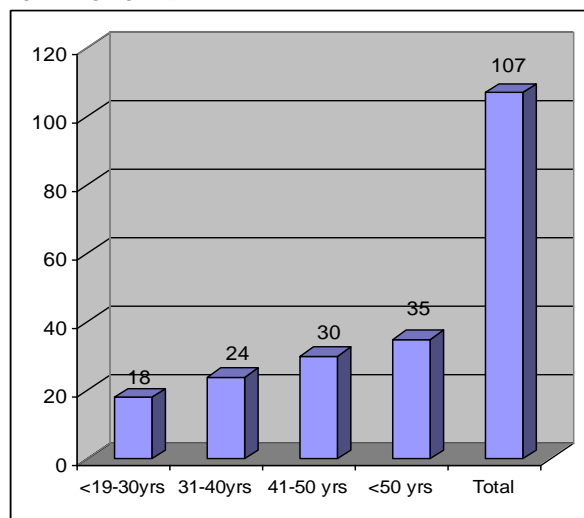


Fig. 4: Distribution of classification of two age groups

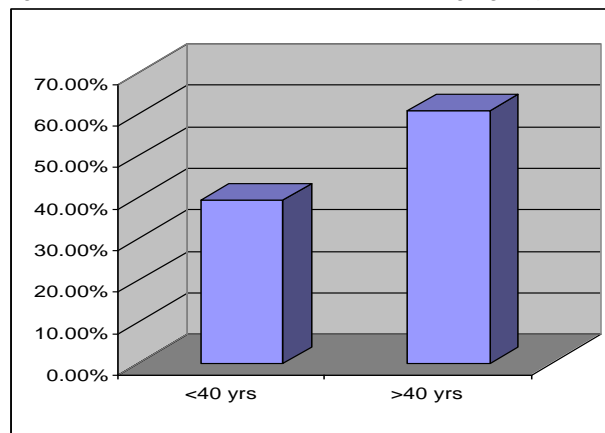


Fig. 3: Distribution of outcome of mortality & recovery rate in Patients of (HAARF)

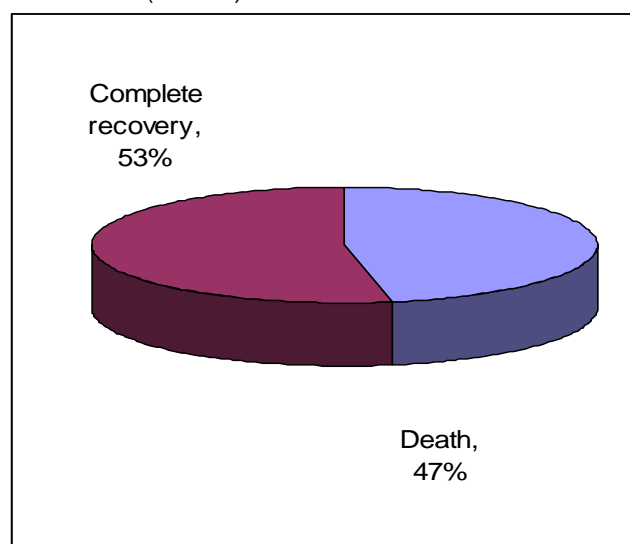


Table 3: Distribution of etiological outcome rate in patients of (HAARF) (n=107)

Etiology of outcome	Frequency	%age
Volume depletion	45	42.05
Postoperative ARF	7	6.54
Acute tubular necrosis (ATN)	15	14.03
Sepsis	40	37.38

Table 2: Distribution of economic status (n=107)

Economic status	Frequency	%age
Poor:(family monthly incom≤ Rs. 10,000)	36	33.64
Middle:(family monthly income Rs. 10,000-25000)	48	44.85
Upper middle: (family monthly income >Rs. 25,000)	23	21.49

Table 8: Comparison of gender & age groups distribution with outcome of mortality & recovery rate (n=107)

	Death	Recovery
Male	15(14%)	50(46.7%)
Female	35(32.7%)	57(53.3%)
Total	50(46.7%)	57(53.3%)
<40 Years	38(35.5%)	04(3.73%)
>40 years	12(11.2%)	53(49.5%)

P value: 0.000* at 95%

DISCUSSION

Acute Renal Failure is a fairly common condition in hospitalized patients. Barret et al reported 200 patients of ARF in three years study³ another prospective study from Arabian Gulf reported 77 patients of ARF in 2 years. A study from university hospital of Philippines reported 110 patients of ARF in 5 years period. ARF is a syndrome with multiple causes which explains its common occurrence in hospitalized patients. ARF affects patients cared for by nearly all health care professionals⁴.

In this study the mean±SD age of the HAARF Patients was 48.12±3.28 years ranging from 19.6-59.4 years and the median age was 40.36 years. A study from Pakistan⁵ in 2005 study of Khan RN, Factors determining outcome of acute renal failure patients which they found same age results of the patients i.e. the study included 100 patients of ARF with a mean age of 48 years. Age ranged from 18 to 80 years. In the present study out 107 cases, 65(61%) cases were males and 42(39%) cases were females. This indicates there was a male predominance in HAARF. A study from Pakistan⁵ found male predominance of 65%. A study from Atlanta [6] found male predominance of 67%.

In our study the age group of patients varied from 19 to 59 years in which maximum patients belonged to age group of 41 to 50 years 30(41.53%) & >50 Years 35. The mean age of the patients was

52.38±17.02 years. The above findings suggest HAARF can occur mainly in the older age group probably due to associated co morbid conditions. An Indian study from Bangalore⁷ also noted the mean age of their patients 48±17 years. In our country severe ARF is usually treated in dialysis units and only pts requiring ventilation are admitted to ICU.

The male predominance in ARF patients is something well documented in most studies^{8,9} but it has not been commented on. Probably the high incidence of prostatic obstruction (55% of the surgical causes of ARF) could be a possible explanation.

In our study out of 107 cases, 50(47%) patients expired, 65(53%) patients had complete recovery. The above findings suggest HAARF has high mortality rate. The mortality rate was 63% in Varanasi¹⁰ study and 60.3% in the study from Pittsburg¹¹. Despite the disappointing ARF mortality rates (>50%) most meta-analysis reveal¹², most agree that ICU high mortality is responsible for the unchanged ARF mortality during the last decades¹³. Nevertheless mortality rate for patients with ARF in hospitalized patients outside ICU in Greece (almost 22%) is comparable even better-to rates referred in other reports-20-40%^{14,15}.

Volume depletion 45(42.05%) & sepsis 40(37.38%) ARF was the most frequent cause of ARF in our hospitals. In Western countries etiology of ARF has changed dramatically the last decades: ATN and prerenal causes outnumber surgical and obstetrical causes outside ICU^{14,15,16}. In ICU patients sepsis shock is the commonest cause of ARF (40-50%) and this answers for the high ICU mortality noticed in recent epidemiological studies¹⁷. We should emphasize the small percentage of glomerulonephritis induced ARF. Liano et al. had also referred similar percentages in their study¹⁴.

In our study, except economic status, all variable like age, gender and education status output were statistically significant with outcome of mortality/recovery factors. Age seems to be a risk factor in almost all studies. It is a fact that elderly patients with ARF have greater risk for death than younger^{17,18}.

CONCLUSION

Hospital acquired acute renal failure most commonly occurred in more than 40 yrs age group of patients. Mortality rate among HAARF patients was 50(47%) patients, and full recovery occurred in 53(57%) cases. Mortality rate for patients with ARF in hospitalized patients Sh. Zayed Medical College/ Hospital Rahim Yar Khan is comparable to rates mentioned in other reports. In our study, except economic status, all variable like age, gender and Education status output were statistically significant

associated with outcome of mortality/recovery factors? It is concluded from our study that the common etiological causes of ARF in HAARF adult patients were volume depletion & sepsis.

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