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Clinical Profile of Acute Renal Failure in Patients

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Abstract: Acute renal failure has increased rapidly in a few days or hours. This may be dangerous. It's commonly regular in people who are fundamentally injured and are now hospitalized. Acute renal failure can be identified by an appropriate history, physical tests and some laboratory tests. The most important risk factors for development of ARF were age >65 years, presence of infection and acute respiratory or circulatory failure. Patients who were admitted in our hospitals and with serum creatinine level >0.5 mg dL^{-1} than baseline level were included in this study. A prospective study of 100 cases of acute renal failure admitted to KIMS, Karad was done. Mortality was also greatly influenced by the primary etiology and associated complications. The study conclude that patients requiring haemodialysis had poor outcome as compared to those managed conservatively.

INTRODUCTION

Acute renal failure or Acute Kidney Injury (AKI), characterized by a rapid decline in glomerular filtration rate (hour-day) and retention of nitrogen wastes such as blood urea, nitrogen and creatinine and excess cellular fluid volume and electrolyte disturbances and acid-base homeostasis. Acute renal failure can be present in 15-20% of all hospital admissions the mortality of which can be as high as 30-40%. Acute renal failure can be identified by an appropriate history, physical tests and some laboratory tests. ARF can be better classified into three types: prerenal, intrarenal and postrenal. Management of ARF includes appropriate fluid, electrolyte replacement, use of appropriate drugs, avoidance of nephrotoxic drugs and toxins, haemodialysis and in rare cases may require renal transplant.

Aim of the study: To study the clinical profile of acute renal failure in patients admitted to KIMS, Karad.

Objectives of the study: To study the clinical profile and complications encountered in patients of ARF along with incidence and need for haemodialysis.

Literature review: The most important risk factors for development of ARF were age >65 years, presence of infection and acute respiratory or circulatory failure. Multiorgan failure seen earlier in patients with ARF and also 3 times higher ICU mortality in these patients (De Mendonca *et al*., 2000; Avathi and Verpootes, 2003). In a study done by GurucharanAvathi, it was found that incidence of acute renal failure was highest in medical ICU followed by burns ICU and surgical ICU. Among the medical causes of ARF, drugs and sepsis were the predominant causes (Avathi and Verpootes, 2003). Use of nephrotoxic drugs is the commonest precipitating factor in hospital acquired ARF (Birader *et al*., 2004). The incidence of ARF is increasing as a result of advanced medical therapy and more complex surgical interventions in older patients with the presence of co-morbidity of hypertension, diabetes mellitus, chronic renal failure, IHD and liver diseases (Bernich *et al*., 2003).

In a study of 120 patients with ARF, Narula concluded that 90 patients (75%) had a medical cause for renal failure. The etiological factors were septicemia (25.6%), falciparum malaria (16.7%), drugs (16.7%), volume depletion (13.3%) and transplant related failure (5.68%). The common clinical presentation were Oliguria (85.2%), Encephalopathy (26.7%), Hyperkalemia (32.2%), Uraemic gastritis (26.9%) acidosis (27.9%), fluid over load (20.5%) and anuria (13%) (Singhal *et al*., 2002).

Renal failure in leptospirosis is thought to be due to the result of direct invasion of the renal tissue by the organism, bacterial enzymes, metabolites, exotoxins, complement mediated damage or vasulotoxicity. Renal electron microscopic studies in leptospirosis have showed interstitial and cellular edema without necrosis and tubular obstruction. Non oliguric ARF is more common in leptospirosis. In a study done by Antonio Cseguro, around 54% were initially oliguric. The pathogenic mechanisms that lead to ARF in snake bitten patients include direct nephrotoxicity of venom, Hypovolaemia, haemolysis, myoglobinuria and DIG. Prognosis is good in patients who present before the development of major systemic complications and receive adequate dose of antivenom. Gupta in his study of 121 patients of snake bite, 15 developed ARF. The 8 patients were treated with dialysis, rest 7 were managed conservatively (Chugh, 2000).

ARF in association with plasmodium vivax malaria is rare. In a study out of 577 cases of ARF by Prakash *et al*. (2002) 94 patients had malaria. Among these 76(80.9%) patients had falciparum and 11(11.7%) patients had vivaxmalaria26. Renal ischaemia is the dominant pathogenic mechanism that results in acute tubular necrosis. Other contributing factors were heavy parasitemia, hypotension and hemolysis (Prakash *et al*., 2002).

Rhabdomyolysis and myoglobinuria induced acute renal failure occur with traumatic crush injury, muscle ischaemia following seizures, excessive exercise, heat stroke or malignant hyperthermia or metabolic disorders like hypophosphatemia, hypokalemia, myoglobin and haemoglobin released can cause direct toxic effects on tubular epithelial cells or these can trigger renal vasoconstriction. In a study done by Naqvi *et al*. (1996) 14 cases were due to prolonged muscular exercises with no previous history of myopathy, neuropathy or renal diseases. Patients regained normal renal function (Naqvi *et al*., 1996).

MATERIALS AND METHODS

Those patient who were admitted to krishna hospital from May, 2011-May, 2013 and having serum creatinine level >0.5 mg dL^{-1} than the baseline level without any history of having chronic kidney disease, obstructive uropathy (calculi, tumours) hypertension, diabetes, congenital renal anamolies or on any known nephrotoxic drugs.

Inclusion criteria: Patients who were admitted in our hospitals and with serum creatinine level >0.5 mg dL^{-1} than baseline level were included in this study. Patient's with serum creatinine level within normal limits with no premorbidities.

Exclusion criteria: Patients with following diseases were excluded Chronic kidney disease (ckd), Hypertension, Diabetes mellitus type 2, Obstructive uropathy, Renal calculi, renal maligancies, tumours, patients on known nephrotoxic drugs and Patients with congenital renal anamolies.

Methodology: Detail history of the concerned subject is taken either from the patient or nearby relative. The complete procedure is explained, all doubts if any are cleared. Subject is then completely examined and all the inclusion criterias are carefully watched. Patient is then evaluated after laboratory investigations and all the deranged parameters if any are carefully monitered. Patient serum creatinine levels are then look for on the day of admission which is measured by modified "Jaffe method" in our institution which is equivalent to criteria met by international standards while serum urea is measured by modified G-LDH method in an automated analyser as per the international standards.

RESULTS AND DISCUSSION

A total of 100 cases of acute renal failure patients were admitted to Krishna Institute of Medial Science, Karad which met the inclusion criteria.

In our present study it has shown that mortality increases as age progresses. In our study higher mortality was observed in patients with age group above 65 years (Table 1).

Table 2 indicated hypotension was present in 52 patients of our study. Out of which 26 patients were in sepsis, 16 patient were in AGE, 5 patients in hepatorenal syndrome, 2 were of snake bite and malaria and 1 of leptospirosis. Encephalopathy was seen in about 30 patients. Hyperkalemia was seen in 20% of patients. It was defined as serum potassium above 5.5 mEq L^{-1}. Anemia was seen in 30% of patients. Multiorgan dysfunction syndrome can (MODS) defined as failure of more than one organ requiring intervention to maintain homeostasis was seen in 24% of patients.

Table 3 indicate that among 100 cases, 78 patients were managed conservatively while 22 patients underwent haemodialysis. Among 78 patients managed

Table 1: Mortality and age

Age group	No. of patients	Total (%)
<24	0	0
25-34	0	0
35-44	2	14
45-54	3	20
55-64	4	26
>65	6	40
Total	15	100

Table 2: Associated complications of acute renal failure

Associated complications	No. of patients	Percentage
Hypotension	52	52
Encephalopathy	30	30
Pulm. Oedema	30	30
Mods	24	24
Metaboloic acidosis	22	22
Hyperkalemia	20	20

Table 3: Management of acute renal failure

Total patients	Conservative management	Haemodialysis
100	78	22

Table 4: Outcome of the disease

Outcome	No. of patients	Percentage
Survived	85	85
Expired	15	15

conservatively 6 patients died whereas 9 patients died who had undergone haemodialysis. The survival rate among patients managed conservatively was 93.58%. The survival rate among patient underwent haemodialysis was 60.33%. Conservative management includes early detection and prompt intiation of treatment. It includes fluid replacement, diuretics, good antibiotic cover.

Table 4 in our present study of 100 cases, 85 patients survived while 15 patients expired. Out of the 15 patients who survived 9 cases were males while 6 were females.

A total of 100 cases of acute renal failure patients were admitted to the Krishna Institute of Medical Sciences, Karad, studying the criteria involved. In our present study it has shown that mortality increases as age progresses. In our study higher mortality was observed in patients with age group above 65 years. In the study of 100 cases showed no correlation between age and mortality. In a review of 499 cases Baslov and Jorgensen has observed that mortality increase in older age. Swann and Merill (1953) have found mortality of 60% in patients above 60 years of age. Turney and Marshal (1990) has also similar findings. Overall mortality in our study was around 15%. The most important cause among which was septicemia with its related complications. As compared to other studies mortality in our study was significantly low because of prompt diagnosis and treatment while death in our study were importantly because of the primary illness and associated complications. Kennedy *et al*. (1973) also observed sepsis related mortality to be 40%. Prakash and Smurthy (2006) also reported evidence of septicemia to be as high as 69.2%. The study conducted by De Vriese and Bourgeois (2003) also showed mortality and acute renal failure has mortality of around 74.5%.

CONCLUSION

A prospective study of 100 cases of Acute renal failure admitted to Krishna Institute of Medical Science, Karad was done. The diagnosis of ARF was based on the clinical and laboratory evidence of elevated blood urea and serum creatinine. In our study, we found that maximum incidence of ARF was in age group above 65 years of age with no sex preponderance. Vomiting and Oliguria are thus the predominant symptoms in our study. Symptoms are thus non specific, related to the existing medical condition and a high index of suspicion and early monitoring of blood urea and serum creatinine is important to identify ARF. Thus, we found that septicemia and acute gastroenteritis constitutes more than 60% causes of acute renal failure in our study. Conservative management included fluid replacement, antibiotic cover and adequate use of diuretics. Patient who failed to respond to conservative management were managed by haemodialysis. It was found that the incidence of mortality increase as the age progresses, mortality being maximum in age group above 65 years (40%). Mortality was also greatly influenced by the primary etiology and associated complications. Septicemia with multiorgan dysfunction (60%) was found to be predominant cause of death. Thus, from our study, we can conclude that patients requiring haemodialysis had poor outcome as compared to those managed conservatively. Hence, early diagnosis and prompt intervention were probably responsible for a good survival rate.

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