Acute renal failure in Nepal Medical College Teaching Hospital

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ABSTRACT

Total 45 patients (male 27 and female 18) of acute renal failure (ARF) admitted in Nepal Medical College Teaching Hospital over a period of 12 months (1st of *Baisakh* 2064 BS to 31st of *Chaitra* 2064 BS) were enrolled in the study. Sixty four percent of study population were of age group 21-60 years. Acute Gastroenteritis 33, sepsis 5, hemorrhage 2, others 5 were the different causes of ARF. Serum creatinine of the study population before and after treatment was 4.35±2.72 and 1.38±0.72 mg/dl respectively. Similarly serum urea before and after treatment was 101.78±57.56 and 42.60±30.46 mg/dl respectively. Thirty three patients were managed by non dialytic modality of therapy and 12 patients needed hemodialysis. Blood urea of those patients who underwent nondialytic therapy was significantly less than of those who underwent hemodialysis (80.65±38.21 vs. 151.08±66.22; p=0.004). Serum creatinine was also significantly lower in nondialytic therapy group (3.15±1.15 vs. 7.64±3.10; p=0.000) ARF patients with very high urea, creatinine and disturbed electrolytes required dialysis. Average session of hemodialysis was 3.4. Thirty five patients were cured, 6 left against medical advice, 3 were discharged on request, and one patient of sepsis expired during the course of treatment. Acute gastroenteritis was the leading cause of ARF and outcome was excellent even without dialysis in most of the cases provided the treatment was started early and appropriately.

Keywords: Acute renal failure, acute gastroenteritis, treatment modalities, outcome.

INTRODUCTION

Acute Renal Failure (ARF) is defined as rapid (over hours to weeks) and usually at least partially reversible decline in glomerular filtration rate(GFR) that may occur either in the setting of preexisting normal renal function (classic ARF) or in someone with preexisting renal disease (acute on chronic renal failure).[1] ARF is associated with significant morbidity and mortality.[2] There are few reports from Nepal on both Chronic Kidney diseases (CKD)[3,4] and ARF.[5,6] Major bulk of ARF patients are being handled by internist in Nepal due to the limited number of Nephrologists and Nephrology centers. In this context we would like to present our experience about ARF in Nepal Medical College Teaching Hospital (NMCTH). It can be a milestone study in the field of ARF and can be a useful guideline in management of ARF. We conducted this study with aims to know the common causes of ARF; to see vulnerable age group for ARF and to study different therapeutic modalities for ARF and their outcome.

MATERIALS AND METHODS

This is a retrospective study conducted at NMCTH over a period of 12 months (1st of *Baisakh* 2064 BS to 31st of *Chaitra* 2064 BS). Admitted patients with history of sudden deterioration in renal function characterized by rise in serum creatinine above normal with or without decreased urine output were enrolled in the study .Patients with acute on chronic kidney disease were excluded from the study. Forty five patients (male 27 and female 18) were included in the study. Patients were evaluated clinically. Laboratory tests like complete blood counts, serum creatinine, urea, sodium and potassium, urine routine and microscopic, stool routine and microscopic, and ultrasonogram of the abdomen were performed. Other special tests were done as per the need of patients' condition. After complete assessment of the patient fluid replacement as well as blood transfusion was done depending upon clinical needs. Antibiotics like ciprofloxacin or doxycycline, and antiprotozoal like metronidazole were used in standard doses for recommended duration to treat acute gastroenteritis (AGE) depending upon the aetiology. Appropriate antibiotics were used to treat sepsis. Frusemide was used in a dose ranging from 40mg to 80mg in a day in well hydrated cases where urine output did not increase. Dopamine was also used in renal perfusion dose (0.5 to 5.0mcg/kg/min) to improve renal perfusion in selected cases to increase urine output.[7] Patients were advised to continue with protein restricted diet (30-40gms/day), calorie 35kcal/kg body weight, salt 2gm/day and restriction of fruits. For statistical analysis SPSS 11.5 program was used. Student's t test was used to calculate p values. p value of d 0.05 is considered to be statistically significant.

RESULT

Of 45 patients, 60.0% were male and 40.0% were female (Fig. 1). Eighteen patients were from age group 21-40 years, 11 were between 41-60 years and 8 each in below 20 years and above 60 years group. Sixty four percent of the study population were of the age group 21-60 yrs (Fig. 2). Mean age of the study population was 39.5 ± 19.4 years (range 13-80 years). Acute gastroenteritis (AGE) was the leading cause of ARF with 33 cases (77.3%) followed by 5 cases of sepsis (11.1%), two of hemorrhage (4.4%) and 5 cases due to other causes (11.1%) (Fig. 3). Other causes of ARF included one each cases of wasp sting, acute pancreatitis and intestinal obstruction and two cases of rapidly progressive glomerulonephritis (RPGN). Thirty five patients were cured and discharged; three patients were discharged on request. Six patients left against medical advice. Of them three could not afford hemodialysis. One patient of septicemia died during his stay in the hospital (Fig. 4). Thirty three patients out of 45 were successfully managed conservatively (non dialytic treatment) and 12 had to undergo hemodialysis (Fig. 5). Average session of hemodialysis was 3.4 (range 2-7).

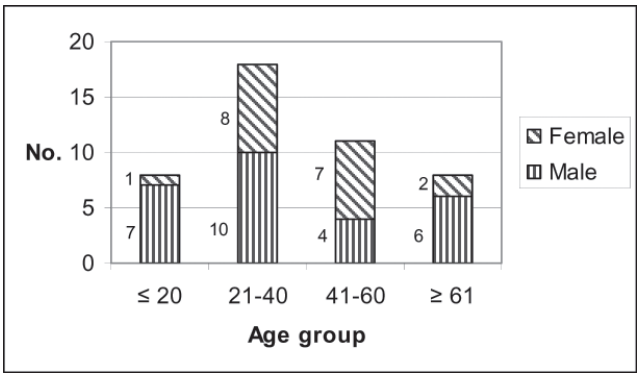

Fig. 2. Distribution of study population according to age group (n=45)

Table-1: Blood parameters of ARF patients at the time of admission and discharge.

Parameters	At admission (n=45)	At discharge (n=45)
Serum Creatinine (mg/dL) mean ± SD (Range; mg/dL)	4.35 ± 2.72 (1.9-13.3)	1.38 ± 0.72 (0.6-3.6)
Blood urea (mg/dL) mean ± SD (Range; mg/dL)	101.78 ± 57.56 (23-284)	42.6 ± 30.46 (13-128)
Serum Sodium (meq/L) mean ± SD (Range; meq/L)	135.48 ± 7.33 (113-147)	137.97 ± 3.69 (127-143.3)
Serum Potassium (meq/L) mean ± SD (Range; meq/L)	4.16 ± 1.07 (2.1-6.8)	3.7 ± 0.45 (2.7-4.8)

Mean serum urea, creatinine, sodium and potassium at the time of admission and discharge are as per tabulated in Table-1. Patients who underwent non dialytic therapy had significantly lower level of blood urea and creatinine at the time of admission than that of those who underwent hemodialysis (Table-2).

DISCUSSION

Majority of the patients were male as compared to females (60.0% vs. 40.0%). Main bulk of ARF patients were between the age group ranging from 21-60 years followed by others. Various authors have observed higher incidences of ARF among the patients aged 80 years and above as compared to patients under age of 50 years. Higher incidences of ARF in elderly population could be due to multiple associated co morbidities which put them at higher risk of ARF.[8,9] In our study younger

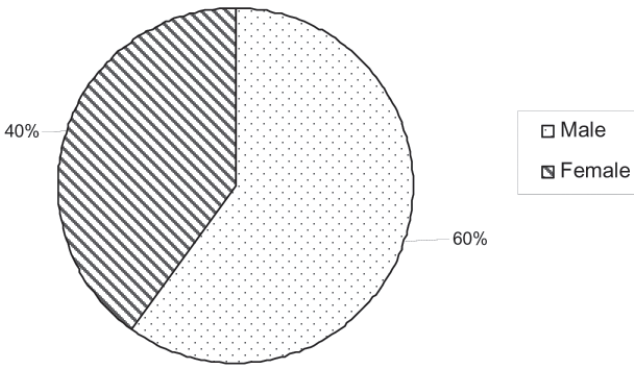

Fig. 1. Distribution of study population according to sex (n=45)

Table-2: Blood parameters at the time admission of patients who underwent either nondialytic or hemodialysis therapy.

Parameters	On nondialytic therapy (n=33)	On Hemodialysis (n=12)	p value
Blood urea mg/dL (mean ± SD)	80.65714 ± 38.21712	151.0833 ± 66.22339	0.004*
Serum Creatinine mg/dL (mean ± SD)	3.154545 ± 1.156528	7.641667 ± 3.103505	0.000**
Serum Sodium meq/L (mean ± SD)	136.55 ± 5.771975	132.3 ± 10.52035	0.25
Serum Potassium meq/L (mean ± SD)	4.056667 ± 0.988794	4.472727 ± 1.278351	0.34

* significant; **highly significant

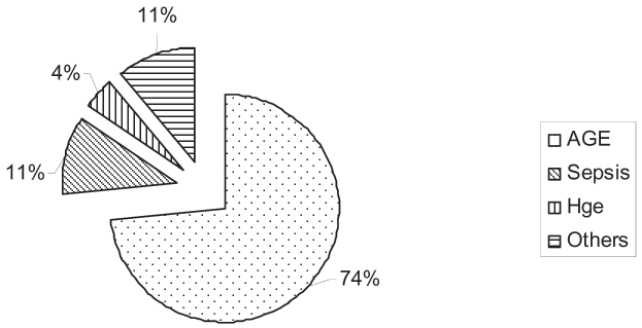

Fig. 3. Cause of Acute Renal Failure (n=45)

patients were more vulnerable for ARF; this may be because of AGE being a leading cause of ARF. Most common organism of AGE was *E histolytica* and some cases were of *V. cholerae*. It should be commented carefully as because the number of patients included in our study is less. We need a larger scale study before making any comments.

Due to poor sanitation and lack of public awareness about personal hygiene AGE still occupies number one position in the developing countries[5,10.11] which is also observed in this study. Sepsis was another important cause of ARF in our study. Sepsis was due to typhoid fever,

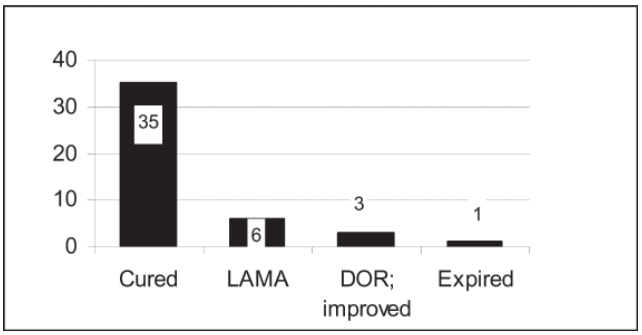

Fig. 4. Outcome of Acute Renal Failure (n=45) (DOR = Discharged on request; LAMA= Left against medical advice)

urinary tract infection and chest infection. Out of 5 sepsis cases one of them expired during the course of treatment. Sepsis accounts for majority of ARF cases in developed countries. In a multicenter study 81 ICU's across Australia, septic shock accounted for 45.0% of cases of ARF requiring dialysis.[12]

Insect stings including wasps and hornet stings are reported form various parts of tropical countries including India.[13] Hornet and wasp stings are frequently seen in our country too. Here we have reported one case of wasp bite from Nuwakot admitted with ARF and recovered after several sessions of hemodialysis. We had 2 cases of RPGN. RPGN is not very common in our setup as compared to studies from other countries. Acute

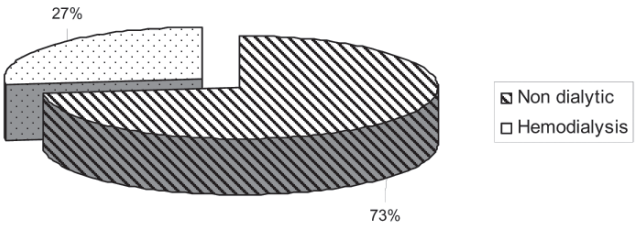

Fig. 5. Distribution of study population according to therapeutic modality (n=45)

pancreatitis and acute intestinal obstruction were also responsible for ARF in this study possibly because of third space volume loss.

Most of the ARF patients (73.3%) with lower serum urea, creatinine at the time of admission were managed successfully by non dialytic modality of treatment which included volume replacement, uses of diuretics and dopamine as per the need.[7] With above measures majority of ARF cases were cured. So, even in the absence of dialysis facility most of the ARF patients can be treated successfully and confidently. This observation is comparable with studies from other countries.[14] Thirty five (77.8%) of 45 patients were cured, 6 (13.3%) left against medical advice. Most of these patients left hospital due to some financial problem. Three out of these 6 patients were in need of hemodialysis, which they could not afford. All six patients never came for the follow up. Three patients (6.7%) were discharged on request however they were improving when discharged and on follow up also their renal function tests were normal. In our study we had one (2.2%) mortality which was a case of sepsis. With supportive therapy outcome of ARF is excellent and mortality is significantly reduced.[15] In our study we observed that those patients who had high serum urea (151.08 ± 66.22 mg'/dL) and creatinine (7.64± 3.1 mg/dL) at the time of admission needed hemodialysis to reverse ARF. Various studies also support early initiation of dialysis in those patients having symptoms of uremia, very high serum urea and creatinine and electrolyte disturbances.[16-18]

Acute gastroenteritis is still the leading cause of ARF in developing country like ours. ARF can be successfully managed even without dialysis in most of the cases. Outcome of ARF is excellent if the treatment is provided early and efficiently. Thus ARF can be prevented in most of cases if the standard of public sanitation improves in our society. In resource poor countries like ours patients with serum creatinine of 3.15±1.15 mg/dL can be managed with non dialytic method provided there are no other indications of hemodialysis.

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