

Causes of Acute Renal Failure: An Etiological Perspective Study

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ABSTRACT

Objective: To look into the causes of acute renal failure in this area so that preventive strategy can be designed.

Study Design: Observational study.

Place and Duration of Study: This study was carried out in Medical Outdoors, District Teaching Hospitals, Ghazi Khan Medical College, DG Khan and Khairpur Medical College, Khairpur Mir's from June 2013 to May 2014.

Materials and Methods: A total of 100 patients of acute renal failure were included in the study.

Results: There were 64 (64%) males and 36 (36%) females with ratio of 1.7:1. 60% patients in the younger age group and age range was 10-70 years. Nausea and vomiting were commonest symptoms in 92% of the patients while 88% patients were oliguric. All patients had tachycardia while 38% had volume over load. Blood urea was more than 100 mg/100 ml in 92% of patients. ARF because of pure medical reasons were seen in 48% of patients while surgical and pregnancy related problems were found in 26% each.

Conclusion: Early referral, identification and treatment of pre-renal factor, good perinatal care and cautious therapeutic decisions can substantially bring down the incidence of acute renal failure.

Key words: Oliguric, Hypertension, Perinatal.

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INTRODUCTION

Acute renal failure (ARF) is characterized by an acute and usually reversible deterioration of kidney function that develops over a period of days or weeks and results in uremia. A marked reduction in urinary volume is usual, but not invariable. 10 to 20% of the patients of acute renal failure are non-oliguric, a relatively happy group.¹

Acute renal failure is one of the most common organ failures in hospital practice and is a very challenging emergency seen in medical, surgical and obstetrical practice. Although acute renal failure is potentially reversible but carries a mortality of 40-50%.² Moreover, acute renal failure is associated with a very high mortality despite advances made in dialysis therapy as well as care of critically ill patients. Although the reasons are poorly understood but it has been attributed to increasing number of elderly patients developing acute renal failure.³

MATERIALS AND METHODS

This study was carried out in Medical Outdoors, District Teaching Hospitals, Ghazi Khan Medical College, DG Khan and Khairpur Medical College, Khairpur Mirs; from June 2013 to May 2014. A total of 100 patients of acute renal failure were included in the study.

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RESULTS

Out of 100 patients 64 (64%) were male and 36 (36%) were female. Male to female ratio was 1.7:1. Maximum number of patients were seen between the age of 21-30 years (Table 1). Nausea and vomiting were the commonest symptoms in 92% of the patients while 88% patients were oliguric as shown in table 2. All patients had tachycardia while 39% had volume over load, 22% were volume depleted and 40% patients were euvolumic (Table 3). Blood urea was more than 100 mg/100 ml in 92 patients and 28 patients were having more than 200 mg/100 ml of blood urea (Table 4). Acute renal failure because of pure medical reasons were seen in 48% of patients followed by surgical and pregnancy related problems as shown in table 5.

Table No.1: Age distribution (n=100)

| Age (yrs) | No. of cases | Percentage |
|-----------|--------------|------------|
| 10-20 | 6 | 6.0 |
| 21-30 | 30 | 30.0 |
| 31-40 | 24 | 24.0 |
| 41-50 | 12 | 12.0 |
| 51-60 | 12 | 12.0 |
| 61-70 | 16 | 16.0 |

Table No.2: Clinical features Symptoms (n=100)

| Symptoms | No. of cases | %age |
|---------------------|--------------|------|
| Nausea and vomiting | 92 | 92.0 |
| Oliguric | 88 | 88. |
| Non-oliguric | 6 | 6.0 |
| Anuric | 6 | 6.0 |
| Shortness of breath | 66 | 66.0 |

Table No.3: Clinical features signs (n=100)

| OSigns | No. of cases | Percentage |
|-----------------|--------------|------------|
| Tachycardia | 100 | 100.0 |
| Edematous | 38 | 38.0 |
| Volume overload | 38 | 38.0 |
| Volume depleted | 22 | 22.0 |
| Euvolumic | 40 | 40.0 |

Table No.4: Laboratory findings (n=100)

| Findings | Cases | %age |
|--------------------------------|-------|------|
| Blood urea 100 mg/100 ml | 92 | 92.0 |
| Blood urea 200 mg/100 ml | 28 | 28.0 |
| S. creatinine 2-6 mg | 30 | 30.0 |
| S. creatinine >6 mg | 70 | 70.0 |
| Low sodium | 60 | 60.0 |
| Increased potassium | 30 | 30.0 |
| ECG showing hyperkalemia | 18 | 18.0 |
| Low calcium | 62 | 62.0 |
| Pulmonary edema on X-ray chest | 20 | 20.0 |

Table No.5: Acute renal failure (n=100)

| Acute renal failure | No. of cases | Percentage |
|------------------------|--------------|------------|
| Pure medically related | 48 | 48.0 |
| Surgically related | 26 | 26.0 |
| Pregnancy related | 26 | 26.0 |

DISCUSSION

Prevalence of ARF in hospital practice is appallingly high. Unfortunately, no reliable statistics about acute renal failure in Pakistan are available hence it is difficult to measure the magnitude of this problem. A study reveals a figure of around 5% acute renal failure of all hospital admissions and every third patient in intensive care unit was having ARF.⁴ Another study reported that out of 2000 hospital admissions, 5% were having acute renal failure. These are the large hospital studies but the incidence of ARF in community is at least twice as high the incidence reported from renal unit based study.⁵

Most of the acute renal failure patients in this study had pure medical reasons 48% while surgically related and pregnancy related admissions were 26% each. This is in contrast to the western studies. A study showed that 60% of all the patients of acute renal failure came with history of trauma and 40% had medical and pregnancy related reasons while 50% of all the patients of ARF had some iatrogenic condition.⁶ Our data show that 74% of all cases of ARF are due to medical and pregnancy related problem. This is a significant divergence from the above study however, another study reveals that the sepsis accounted for 38.3%, pregnancy related ARF was seen in 25.7%, haemorrhage in 10.3%, acute GN in 4.6%, obstructive uropathy in 3.4%, nephrotoxic and other poisoning 8.5% of all patients.⁷

In our present study, ARF due to acute GN was seen in 8% of the patients. A study quoted that 7% of all

patients of acute renal failure were having glomerulonephritis.⁸ Another study reported acute glomerulonephritis in 4.6% of the cases.⁷ It is reported in a study that nephrotoxic drugs (particularly NSAIDs and aminoglycosides) were responsible in 13% of all hospital acquired ARF. This is in contrast to the studies reporting higher incidence of nephrotoxic drugs induced acute renal failure.^{9,10}

Analysis of the case record of these 100 patients shows that 58 patients had pre-renal element as the initiating event of ARF but many times more than one etiological factor is responsible. In a study, 600 cases of ARF because of acute tubular necrosis were analyzed which showed that about half of the cases had more than single insult to the kidney function¹¹. Another study revealed that 55% of all patients of ARF had pre-renal element⁸. However, it is found that 40-80% of all cases of acute renal failure had pre-renal reasons.¹⁰

Pregnancy related acute renal failure accounted for 26% patients. These figures are very frightening and quite high as compared with other study⁷. In the developed world, the incidence of pregnancy related ARF has substantially come down as reported by various observers. In a report, the incidence of pregnancy related ARF fell from 40% to 4.5%.¹² Early recognition of ARF with prompt therapy of reversible cases lead to more favourable outcomes for both gravid and fetus.¹³ A Pakistani study reported that the incidence of pregnancy related ARF is much higher than reported in literature and 50% of their patients did not show any recovery in kidney function.¹⁴

CONCLUSION

Early referral, identification and treatment of pre-renal factor, good perinatal care and cautious therapeutic decisions can substantially bring down the incidence of acute renal failure.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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