

A PROSPECTIVE STUDY OF EPIDEMIOLOGY, CAUSES AND PROGNOSIS OF ACUTE RENAL FAILURE IN A TERTIARY CARE HOSPITAL

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Abstract

Introduction: Acute Renal Failure, is a clinical syndrome characterized by an abrupt decline in glomerular filtration rate sufficient to decrease the elimination of nitrogenous waste products (urea and creatinine) and other uremic toxins. Acute kidney injury (AKI) is a common clinical syndrome with a broad range of etiological profile. It is associated with major morbidity and significant mortality due to the severity of the causative illness. This study is to determine the various causes of AKI, in our hospital and to find out the incidence of AKI by using renal failure indices and to analyze outcome of AKI pertaining to the aetiology.

Materials and methods: The present work is a prospective study conducted in Department of Nephrology, Govt General Hospital, Guntur Medical College, Guntur, from March 2021 to February 2022. This study consists of 100 cases with symptoms and signs of acute renal failure admitted under Department of Nephrology. Acute renal failure is defined as a deterioration of renal function over a period of hours to days, which results in an increase in serum creatinine of > 0.5 mg per decilitre over the baseline value, an increase of more than 50 percent over the baseline value or a decrease in renal function that results in the need for dialysis. Oliguria (Urine output of less than 400 mL/day) is a frequent but not invariable clinical feature. ARF may or may not be symptomatic.

Results: 100 patients diagnosed to have ARF as per the criteria described previously were studied and the following observations were noted. The age of the patients included in the present study ranged from 13 to 82 years. Out of the 100 cases studied, 70 were males and 30 were females with a male : female ratio of 7:3. Out of the 100 cases studied, 34 died in the hospital suggesting a mortality of 34 percent; 28 patients were referred for dialysis and were lost to follow up (28%); 36 patients (36%) had complete recovery from ARF. Out of 42 gastroenteritis cases, 26 had complete recovery in hospital; 10 were referred for dialysis and 6 died in the hospital. Out of 28 snake bite patients 10 patients had complete recovery, 8 patients died and 10 patients were referred for dialysis and lost for followup.

Conclusion: The most common cause of ARF is gastroenteritis, so simple remedial measures like using clean sanitary, drinking water, improvement of general hygiene, good obstetric care, control of mosquitoes and use of oral rehydration solution for diarrhoea can go a long way in decreasing the incidence of ARF in the developing world. Physician should be aware of the complication, close attention to haemodynamic, volume status and avoidance of nephrotoxic medications is important to have better outcome in ARF patient.

Key Words: Acute Renal Failure, Oliguria, gastroenteritis, rehydration.

INTRODUCTION

Acute Renal Failure, is a clinical syndrome characterized by an abrupt decline in glomerular filtration rate sufficient to decrease the elimination of nitrogenous waste products (urea and creatinine) and other uremic toxins. Acute kidney injury (AKI) is a common clinical syndrome with a broad range of etiological profile.¹ It is associated with major morbidity and significant mortality due to the severity of the causative illness. This study is to determine the various causes of AKI, in our hospital and to find out the incidence of AKI by using renal failure indices and to analyze outcome of AKI pertaining to the aetiology.²

Acute kidney injury (AKI) affects one in five hospitalized patients. The epidemiology of AKI in developing countries is unique in that certain causes, such as the infections, obstetric causes and nephrotoxins, which are largely obsolete in developed countries remain important causes.³

AKI now understood to be an increasingly common and potentially catastrophic complication in hospitalised patients. There are many Western studies conducted on the causes and prognosis of ARF, but very few Indian studies.⁴ So this study was conducted with the aim being to study the Epidemiology, various aetiological, precipitating factors, pattern of complications and the prognosis with reference to immediate outcome of acute renal failure patients.⁵

MATERIALS AND METHODS

The present work is a prospective study conducted in Department of Nephrology, Govt General Hospital, Guntur Medical College, Guntur, from March 2021 to February 2022. This study consists of 100 cases with symptoms and signs of acute renal failure admitted under Department of Nephrology.

Acute renal failure is defined as a deterioration of renal function over a period of hours to days, which results in an increase in serum creatinine of > 0.5 mg per decilitre over the baseline value, an increase of more than 50 percent over the baseline value or a decrease in renal function that results in the need for dialysis. Oliguria (Urine output of less than 400 mL/day) is a frequent but not invariable clinical feature. ARF may or may not be symptomatic.

Criteria for Selection of Patients

1. Patients who satisfied the above clinical criteria were included in the study.
2. Patients with signs and symptoms suggesting acute renal failure due to obstructive uropathy were excluded from the study after abdominal ultrasonography.
3. Patients who presented with symptoms and signs suggesting prerenal ARF, who improved after correction of haemodynamic status within 24 hours were excluded from the study.
4. Patients with past history of renal disease were excluded from the study.
5. Only inpatients were included in the study.

A detailed history of the age, sex, socioeconomic status, presenting complaints were obtained; the chronological account of the problems, the treatments undergone prior to admission and associated symptoms were obtained. History of any pre-existing renal disease was obtained and patients were investigated for the underlying causes for ARF.

At the same time, patients were started on appropriate conservative therapy. Whenever possible the aetiological factors were treated or the offending agents withdrawn.

Restoration of systemic and renal haemodynamic was undertaken with volume repletion when necessary.

The patient was monitored for the development of complications during the stay in the hospital, such as volume overload, oedema, symptoms and signs of uraemia, electrolyte and acid base disturbances, infection and septicaemia, anaemia and bleeding.

Patient was referred for dialysis if the patient had clinical or biochemical deterioration despite conservative therapy or when the patients presented with severe uraemia.

Other organ failure developing during the stay was documented. The outcome of the ARF and the patient in each case was documented and percentage was calculated.

RESULTS

100 patients diagnosed to have ARF as per the criteria described previously were studied and the following observations were noted. The age of the patients included in the present study ranged from 13 to 82 years. Out of the 100 cases studied, 70 were males and 30 were females with a male : female ratio of 7:3.

Age group	No of patients	Percentage
12-25 years	22	22%

26-40 years	24	24%
41-55 years	24	24%
>55 years	30	30%

Table 1: Age Distribution

Gender	No of patients	Percentage
Male	70	70%
Female	30	30%

Table 2: Gender Distribution

COPD	6
Diabetes	6
Cerebrovascular Disease	2
Hypertension	6
IHD	4
Cirrhosis	2
Chronic Hepatitis B	2

Table 3: Chronic Diseases Present in the ARF Patients

Systolic BP in mm of hg	<60 mmHg	<80 mmHg	<100 mmHg	>100 mmHg
No of patients	16	18	24	46

Table 4: Systolic BP at Admission

S.No	Cause for ARF	No of patients	Percentage
1	Acute Gastroenteritis	42	42%
2	Snake Bite	28	28%
3	Malaria	6	6%
4	Hepatorenal Syndrome	4	4%
5	Obstetric Causes (1 Septic Abortion 1 Pre-Eclamptic Toxaemia)	4	4%
6	Sepsis	4	4%
7	Crush Syndrome	2	2%
8	Cardiogenic Shock due to MI	2	2%
9	Abdominal Angina	2	2%

	known IHD		
10	Glomerulonephritis	2	2%
11	Gangrene Leg Diabetes Mellitus	2	2%
12	Malignant Hypertension	2	2%

Table 5: Etiology of Acute Renal Failure

S.No	Outcome	No of patients	Percentage
1	Complete Recovery	36	36%
2	Referred for dialysis	28	28%
3	Mortality	34	34%

Table 6: Outcome of the Study

Out of the 100 cases studied, 34 died in the hospital suggesting a mortality of 34 percent; 28 patients were referred for dialysis and were lost to follow up (28%); 36 patients (36%) had complete recovery from ARF. Out of 42 gastroenteritis cases, 26 had complete recovery in hospital; 10 were referred for dialysis and 6 died in the hospital. Out of 28 snake bite patients 10 patients had complete recovery, 8 patients died and 10 patients were referred for dialysis and lost for followup.

DISCUSSION

The aetiology, course and outcome of ARF are closely linked to the prevailing socioeconomic and environmental conditions in a given geographic location.⁶ Consequently, a large disparity exists between the aetiology of acute renal failure in the economically advanced countries with temperate climates and that in the third world countries with limited resources and exposure to tropical conditions.⁷

The true incidence of ARF in the community is available only from limited geographical zones. A survey of 32 centres engaged primarily in chronic dialysis in Europe, North Africa and Middle East revealed that 29 patients/million/year required acute dialysis. Comparable data however are not available from most tropical countries. If referrals to the dialysis units are a reliable guide, the condition is far more frequent in Asia (Chugh et al 1991). The question regarding the incidence of milder forms of ARF has been addressed by only three studies (Hou et al 1983, M.J. Hanley et al 1981, Kumar et al 1973), whereas 2-4% of all hospital admissions had ARF of varying severity, only 8-14% of these required dialytic support.⁸

In this study, management of ARF was by conservative methods. It was found that, about one-third of patients with ARF can be managed by conservative measures alone. For nearly three fourths (71.6%), dialysis was required. The overall mortality in this series was 27.8%.⁹

It was observed that other common tropical conditions like glomerulonephritis, leptospirosis and copper sulphate poisoning are important causes of ARF in Tamil Nadu. It was also observed that G-6-PD deficiency causing intravascular haemolysis and ARF was rare in South India (1 case) as compared to Northwest of India (Chandigarh study), 30 where there was a higher incidence (12% of cases).¹⁰

CONCLUSION

ARF is a condition in which despite rational supportive and replacement therapy, the mortality rate is still high (Approx.50%). The pattern of ARF in the third world countries is different from that in the developed countries. The common conditions causing ARF in tropics include acute gastroenteritis, infectious diseases, snake bite and pregnancy related causes. Simple remedial measures like using clean sanitary, drinking water, improvement of general hygiene, good obstetric care, control of mosquitoes and use of oral rehydration solution for diarrhoea can go a long way in decreasing the incidence of ARF in the developing world. Delay in seeking treatment is an important factor in precipitating ARF and also was associated with adverse outcomes. On the part of the physician, close attention to haemodynamic and volume status and avoidance of nephrotoxic medications is important.

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