

# Acute Febrile Infectious Diseases with Acute Renal Failure

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## Abstract

**Introduction:** Infectious diseases are an important cause of morbidity and mortality in our country. Tuberculosis, falciparum malaria, and leptospirosis are some of the common infectious diseases associated with mortality.

**Aim:** The aim of the study is to study the causes, clinical features, and associated organ dysfunction in patients with acute febrile illnesses with acute renal failure.

**Materials and Methods:** Patients with fever and serum creatinine level  $\geq 1.5$  were included in the study. Patients with acute diarrheal diseases, obstetric patients, surgical patients, chronic renal failure pre-existing renal disease, diabetes mellitus, and nosocomial infection were excluded.

**Results:** 40 patients with infectious diseases with acute renal failure, leptospirosis was the most common illness (45%) followed unclassified group (40%), falciparum malaria (10%), and sepsis 5%.

**Conclusion:** Serum creatinine 1.5 and above is an early marker of severe infection and aggressive therapy reduced mortality.

**Key words:** Acute renal failure, Infectious diseases, Mortality and morbidity

## INTRODUCTION

Worldwide incidence of acute kidney injury (AKI) is variable, and even more among the developed and the developing countries. Tropical acute febrile illnesses such as malaria, typhoid, leptospirosis, dengue, and others are a major cause of AKI in the tropics.<sup>1-3</sup>

Infectious diseases are an important cause of morbidity and mortality in our country. Tuberculosis, falciparum malaria, and leptospirosis are some of the common infectious diseases associated with mortality.<sup>4</sup> Complicated falciparum malaria, leptospirosis, and sepsis are associated with multi-organ dysfunction. Acute renal failure is an important

component of multi-organ dysfunction. Jaundice occurs quiet early. Detection of acute renal failure in the early stage of infectious diseases and aggressive management of these illnesses will reduce the mortality.<sup>5</sup> Hot and humid climate that is conducive to support life in its various forms is the hallmark of tropical ecosystem. Persistence of microorganisms, their reservoirs and vectors are greatly facilitated by this tropical ecology. The great biodiversity adds to complex interactions between them and adds to evolution with changing circumstances. Human contact with this ecosystem in almost unavoidable in most of the poor tropical countries because of prevailing poor social and economic circumstances translating into increased susceptibility to infections and poor access to health-care services.<sup>6-8</sup>

## AIM

The aim of the study is to study the causes, clinical features, and associated organ dysfunction in patients with acute febrile illnesses with acute renal failure.

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## MATERIALS AND METHODS

The observational prospective study was conducted in the Department of Medicine, Stanley Medical College, Chennai. Ethics committee approval and informed consent from the patients were obtained. Patients with fever and serum creatinine level  $\geq 1.5$  were included in the study. Patients with acute diarrheal diseases, obstetric patients, surgical patients, chronic renal failure pre-existing renal disease, diabetes mellitus, and nosocomial infection were excluded. Demographic details, clinical examinations, and medical history were recorded. Urine analysis, complete blood count, electrolytes, liver function test, peripheral smear for malarial parasite, quantitative buffy coat for malarial parasite, widal, chest X-ray, posteroanterior, electrocardiogram, ultrasonography abdomen, macroscopic slide agglutination test, microscopic agglutination test, urine culture and sensitivity, blood culture and sensitivity were done.

## RESULTS

Of the 40 patients with infectious diseases with acute renal failure, leptospirosis was the most common illness 45%, followed by unclassified group 40%, falciparum malaria 10%, and sepsis 5%. Leptospirosis - total 18 patients in that 11 male, 7 female patients. The mean age of the patients is 39.8 (Figure 1).

Fever (100%), myalgia (67%), headache (28%), and conjunctival suffusion (22%) were the common clinical features in leptospiral renal failure patients. Jaundice occurred in 5 patients among 18 patients of leptospirosis, 4 cases had protein urea (mild, nonnephrotic). 10 cases had anemia. 5 cases had hyponatremia. 2 cases had hypokalemia. 1 case had thrombocytopenia (Tables 1 and 2).

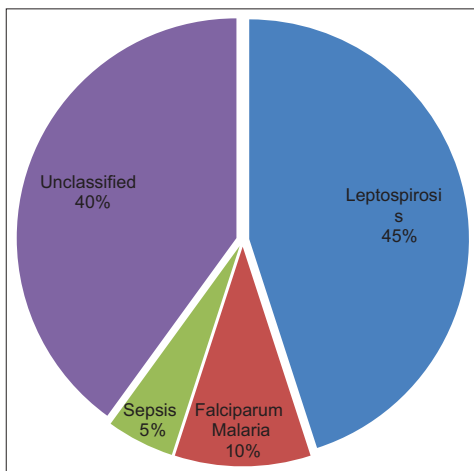


Figure 1: Distribution of infections

All cases of falciparum malaria had mild renal failure only. 3 cases had jaundice; all had anemia. 2 cases of leptospirosis with severe renal failure were dialyzed and recovered completely. 2 cases from unclassified group died as they were in shock at the time of admission. In all other patients, there was complete recovery and the creatinine value was below 1.2 at the time of discharge.

## DISCUSSION

Infectious diseases are an important cause of acute renal failure in tropical countries. The common infectious diseases producing acute renal failure are leptospirosis, falciparum malaria, and sepsis. Difficulties in evaluating the various causes of acute renal failure are due to the lack of adequate diagnostic facilities. Acute renal failure in infectious diseases is a sign of severe illness.<sup>9</sup> Early detection can improve the patient's survival by aggressive management. In our study, of 40 patients with acute renal failure due to infectious diseases, leptospirosis, and falciparum malaria were the important causes. In many patients, we could not identify the organism due to lack of sophisticated diagnostic facilities and they

Table 1: Distribution of sign and symptoms

Symptoms and sign	Among 40 patients	Leptospiral renal failure	Unclassified group
Fever	40	18	16
Myalgia	21	12	8
Headache	11	5	6
Vomiting	16	6	4
Diarrhea	5	2	2
Jaundice	13	5	4
Bleeding diathesis	1	1	-
Altered sensorium	4	3	1
Oliguria	9	4	4
Anemia	30	10	14
Conjunctival suffusion	4	4	-
Hepatosplenomegaly	13	7	5

Table 2: Distribution of investigations

Investigation	Among 40 patients	Leptospiral renal failure	Unclassified group
Proteinuria	11	4	5
Leukocytosis	1	-	1
Hypoglycemia	2	1	1
Hyponatremia	6	5	-
Hypokalemia	9	2	3
Acidosis	1	1	-
Alkalosis	2	-	-
Increased SGOT	10	6	2
Increased SGPT	10	6	2
Increased SAP	2	-	-
Thrombocytopenia	1	1	-

SGOT: Serum glutamic oxaloacetic transaminase, SAP: Serum alkaline phosphatase, SGPT: Serum glutamic pyruvic transaminase

were grouped as unclassified.<sup>10</sup> Most of them responded to quinine therapy, and we presumed that these patients were due to malarial renal failure. It has been our policy to treat such patients as malarial renal failure. Leptospirosis is the most common cause of acute renal failure in our study. Leptospirosis is a zoonosis and has been reported recently from various parts of the country. Leptospirosis is clinically characterized by the mild form which contributes 90% of the case (anicteric) and severe form. About 5.5%, severe renal failure in 16.6%, 2 cases of severe leptospiral renal failure underwent dialysis and recovered completely. 4 cases had proteinuria (mild, nonnephrotic). 10 cases had anemia. 5 cases had hyponatremia. 2 cases had hypokalemia. 1 case had thrombocytopenia. Total count was normal. Mortality in the previous study at GH Chennai was 20.8%. There was no mortality in our study among leptospiral renal failure patients probably because of early detection and aggressive therapy. Falciparum malaria is an important cause of infectious diseases causing acute renal failure. Falciparum malaria-causing renal failure is more common in North India. Recently, the incidence has been increasing in South India also.<sup>11-14</sup>

## CONCLUSION

Raised creatinine was valuable in the early diagnosis of severe leptospirosis and complicated falciparum malaria. There was no mortality in leptospirosis probably due to early diagnosis of severe illness and aggressive management. Similarly, in falciparum malaria (diagnosed and unclassified) early diagnosis reduced the mortality. We

conclude that serum creatinine is an early marker of severe infection and aggressive therapy reduced mortality.

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