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Original Research Paper

General Medicine

SEPSIS AS A MORTALITY INDICATOR IN ACUTE KIDNEY INJURY PATIENTS IN ICU

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ABSTRACT Sepsis is an extreme and dysregulated inflammatory response to infection that is distant from the primary site of infection resulting in end-organ damage. Appearance of acute kidney injury (AKI) during sepsis raises patient morbidity, predicts higher death rates, has a significant effect on functions of multiple organs, is associated with a prolonged duration of stay in the intensive care unit, and hence warrants appropriate healthcare resources. Pathophysiology, diagnostic procedures and appropriate therapeutic interventions in sepsis are still highly debatable despite impressive advances in several medical fields. The overwhelmingly high mortality rate of sepsis is not reduced despite multiple immunomodulatory agents showing promise in preclinical studies. Major obstacles to progress in understanding, early diagnosis, and implementing effective therapeutic modalities in sepsis-induced AKI comprise minimal histopathological data, few animal models closely emulating human sepsis, and a relative lack of specialized diagnostic tools. Here we analyse 100 ICU patients who developed AKI and sepsis as a major etiological factor as well as mortality indicator.

KEYWORDS : Sepsis, Acute Kidney Injury, Mortality, Intensive Care Unit, Etiology.

INTRODUCTION

Acute Kidney Injury (AKI) is a complex condition that manifests in a number of clinical scenarios with it manifestations ranging from modest plasma creat inine escalation to anuric renal failure.It is often under-recognized and has severe consequences[1–4].

Recent epidemiological studies show the wide variation in etiology and risk factors[1,5–7], identify the increased mortality associated with this disease (especially when dialysis is required)[1,4,6,8,9], and indicate a relationship to the subsequent development of chronic kidney disease (CKD) and development of dialysis dependence[1,4,8,10–12].

Emerging evidence suggests that even minor serum creatinine changes are associated with higher in-patient mortality[13–15]. Over the past decades, AKI has been the focus of extensive clinical and basic research. A major limitation has been the absence of a universally recognized definition of AKI. Despite significant progress in understanding the biology and mechanism of AKI in animal models, there has been limited translation of this knowledge into improved patient management and outcomes.

Acute Kidney Injury Network (AKIN) is an independent collaborative network of experts selected by the participating societies to represent their field of expertise as well as their sponsoring organization. AKIN seeks to promote global, interdisciplinary and intersocietal partnerships in order to ensure success in the area of AKI and achieve the best results for patients with or at risk of AKI.

AIMS AND OBJECTIVES

To study and analyze the etiology of AKI and sepsis as a mortality indicator in AKI patients in ICU.

SAMPLE SIZE : 100

INCLUSION CRITERIA :

All patients admitted to ICU with AKI and those who developed AKI after admission to ICU.

EXCLUSION CRITERIA :

- Patients with pre-existing renal disease and with renal transplant.
- Patients with abnormal kidney size and abnormal cortico-medullary differentiation.

RESULTS AND DISCUSSION

100 patients have been analyzed in our research. There were 52 males and 48 females. The mean age was 59.5 years. In the sixth to eighth decade, the highest number of cases were reported. Mehta et al., in her study analysed a sample population which had 59% males and 41% were females with mean of 59.5years.[46]

Sepsis was found to be the leading cause of Acute Kidney Injury in the current study (40%) as has been time and again proven by multiple studies in the past like Muthusethupathi et al[47] in Chennai. This study has shown that among 40 patients with sepsis, 18 patients expired ($p<0.001$) and sepsis was hence found to be an indicator of higher mortality rates than those without sepsis. Mortality due to septicemia was observed to be 75%. This was identical to the findings of Qutub HO, Saeed IA[48] in their three-year long prospective study (1996 to 1999) in which sepsis emerged as the leading cause of Acute Kidney Injury and also a major contributor for mortality. They also stated that prevention of sepsis would improve the prognosis of patients who got admitted into ICU due to any other cause.

In another study conducted by Agarwal et al[49] at CMC Vellore in 2004, similar observations were made in pediatric population vis-a-vis septicemia. It was found that mortality due to septicemia was 83% among ICU patients who had Acute Kidney Injury and was a major contributor to morbidity and mortality.

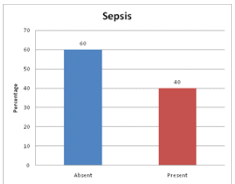

Figure 1 : Proportion of cases with sepsis

Table 1 : Outcome based analysis of sepsis

			Outcome		Total
			EXPIRED	RECOVERED	
Sepsis	PRESENT	Count	18	22	40
		% within Sepsis	45.0%	55.0%	100.0%
		% within Outcome	75.0%	28.9%	40.0%
		% of Total	18.0%	22.0%	40.0%
	ABSENT	Count	6	54	60
		% within Sepsis	10.0%	90.0%	100.0%
		% within Outcome	25.0%	71.1%	60.0%
		% of Total	6.0%	54.0%	60.0%
Total		Count	24	76	100
		% within Sepsis	24.0%	76.0%	100.0%
		% within Outcome	100.0%	100.0%	100.0%
		% of Total	24.0%	76.0%	100.0%

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