Original Article

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A Comparative Study to Assess the Determinants and Outcomes of Sepsis Treated in Medical Wards and ICU in an Indian Teaching Hospital

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Abstract

Background: Sepsis is a systemic, deleterious host response to infection. Severe sepsis is defined as acute organ dysfunction secondary to documented or suspected infection and septic shock is severe sepsis with hypotension not reversed by fluid resuscitation. The present study was conducted to assess the determinants and outcomes of sepsis treated in medical wards and ICU. **Subjects and Methods:** The study was done at Subbaiah Institute of Medical Sciences, Shivamogga, Karnataka. 320 patients with sepsis of both genders were divided into 2 groups. Group I patients were admitted to the medical ward and group II to ICU. Clinical examination and laboratory tests were done. **Results:** Source of infection was a urinary tract in 12% in group I and 11% in group II, a respiratory tract in 40% in group IU and 32% in group II, GIT in 25% and 22% in group I and II respectively, blood infection in 15% and 20% in group I and II respectively and soft tissue infection in 8% and 15% in group I and II respectively. The difference was significant (P< 0.05). Appropriate specimen culture was present in 75 in group I and 64 in group II and blood culture in 42 in group I and 23 in group II. The difference was non-significant (P> 0.05). **Conclusion:** Clinical features and co-morbidities were higher in ICU patients as compared to the medical ward.

Keywords: Sepsis, Comorbidities, Medical ward

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Introduction

Sepsis is a systemic, deleterious host response to infection. Severe sepsis is defined as acute organ dysfunction secondary to documented or suspected infection and septic shock is severe sepsis with hypotension not reversed by fluid resuscitation. Sepsis is the tenth leading cause of death worldwide, with a case fatality rate of 20% to 30% even in the developed nations of the world.[1] The data from the developing countries is scarce; in one multicentric study in an ICU setting from India, the incidence and in-hospital mortality rate of severe sepsis were 16.45% and 65%. A greater understanding of the physiological variables which influence outcome from sepsis and septic shock may assist in attempts to improve survival by providing further insights into the underlying pathophysiology, guiding the development of new experimental models, indicating potentially valuable areas for further research and suggesting new therapies. Such information might also enable the clinician to identify those patients at greatest risk who may need early or more aggressive intervention and could be used to guide treatment at the bedside.[2]

Patients with sepsis who are admitted to the ICUs usually suffer from multiple organ dysfunction and/or perfusion abnormalities and therefore are more acutely ill than those treated in medical wards (MW).[3] The use of early protocolized resuscitation goals has been associated with reduced mortality in septic shock. However, strong evidence-based recommendations for the continued management of patients with septic shock in the ICU setting are currently lacking.[4] Appropriate antibiotic therapy is the cornerstone of management in septic shock and has a great influence on hospital mortality. Inappropriate antibiotic therapy is defined as an antimicrobial regimen that lacks in vitro activity against the isolated organisms responsible for the infection. This can lead to treatment failures and adverse outcomes.[5] The present study was conducted to

assess the determinants and outcomes of sepsis treated in medical wards and ICU.

Subjects and Methods

The present study was done at Subbaiah Institute of Medical Sciences, Shivamogga, Karnataka among 320 patients with sepsis of both genders. Sepsis was diagnosed using the 'International Sepsis Definitions Conference' criteria. All patients were informed regarding the study and their consent was obtained.

Data such as name, age, gender etc. was recorded. Patients were divided into 2 groups depending upon their admission to the medical ward and ICU. Group I patients were admitted to the medical ward and group II to ICU. Clinical examination and laboratory tests such as complete blood counts, chest x-ray, ultrasonography abdomen, CT scan along with cultures from sputum, serous fluids and blood were done. Results thus obtained were subjected to statistical analysis. A P-value of less than 0.05 was considered significant.

Results

[Table 1] shows that there were 90 males and 70 females in group I and 75 males and 85 females in group II.

[Table 3 & Figure 1] shows that the source of infection was a urinary tract in 12% in group I and 11% in group II, a respiratory tract in 40% in group IU and 32% in group II, GIT in 25% and 22% in group I and II respectively, blood infection in 15% and 20% in group I and II respectively and soft issue infection in 8% and 15% in group I and II respectively. The difference was significant (P< 0.05).

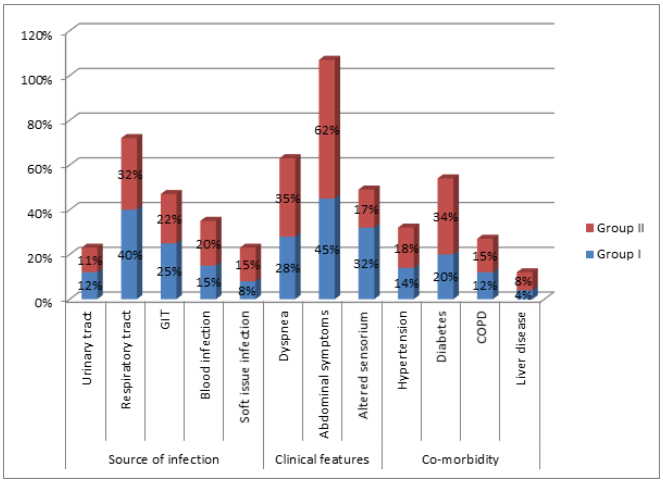

Figure 1: Assessment of parameters

[Table 3] shows that appropriate specimen culture was present in 64 in group I and 75 in group II and blood culture in 23 in group I and 42 in group II. The difference was non-significant (P> 0.05).

Discussion

Septic shock affects 750,000 people annually and accounts for 10 % of all deaths annually in the USA. In recent years, outcomes in patients with septic shock have improved; however, mortality still remains high at 40 – 50 %.[6,7] With an aging population, the incidence of sepsis and severe sepsis has increased.[8] It has been shown that patients with septic shock who receive inappropriate antimicrobial therapy have a high risk of mortality. Administration of timely appropriate antibiotic therapy is one key component of septic shock management. Septic shock is a complex process with the interplay of host defense and dysregulation of the 'inflammatory network'.[9] It is challenging for physicians to optimize therapy when fixed patient features such as age and underlying comorbidity can negatively influence mortality. However, outcomes can also potentially be affected by physician management decisions including fluid balance, corticosteroid use, glucose control and adherence to protocols including early goal-directed therapy and infection control measures.[10] The present study was conducted to assess the determinants and outcomes of sepsis treated in medical wards and ICU.

In the present study, there were 90 males and 70 females in group I and 75 males and 85 females in group II. Bhattacharya et al,[11] conducted a study I which two hundred forty-five sepsis patients (MW=150, ICU=95), ≥18 years, selected randomly, were studied to compare aetiology, co-morbidities, clinical & microbiological profile and short-term outcome between MW and ICU sepsis. Sepsis was more common in elderly males, both in MW and ICU (median age: 56.7, 59.2 years; male: female ratios = 1.34:1, 1.63:1 respectively). The frequency of presenting symptoms, co-morbidities and sources of sepsis were similar in both groups (p>0.05). The frequency of positive microbiological culture, the pattern of microbial flora and antimicrobial resistance patterns were similar in both groups (p>0.05). The number of antibiotics used was significantly higher in ICU compared to MW; multi-organ dysfunction and mortality were significantly higher in ICU settings. While sepsis and severe sepsis were significantly higher in MW, septic shock was significantly higher in ICU. Mortality in both settings was highest in septic shock and multi-organ dysfunction. The duration of hospital stay was significantly shorter in MW than in ICU.

We found that the source of infection was a urinary tract in 12% in group I and 11% in group II, a respiratory tract in 40% in group IU and 32% in group II, GIT in 25% and 22%

Table 1: Distribution of patients

Groups	Group I (160)	Group II (160)
Admission	Medical ward	ICU
M:F	90:70	75:85

Table 2: Assessment of parameters

Variables	Parameters	Group I	Group II	P-value
Source of infection	Urinary tract	12%	11%	0.05
	Respiratory tract	40%	32%	
	GIT	25%	22%	
	Blood infection	15%	20%	
	Soft issue infection	8%	15%	
Clinical features	Dyspnea	28%	35%	0.04
	Abdominal symptoms	45%	62%	
	Altered sensorium	32%	17%	
Co-morbidity	Hypertension	14%	18%	0.01
	Diabetes	20%	34%	
	COPD	12%	15%	
	Liver disease	4%	8%	

Table 3: Culture positivity rates in both groups

Culture	Group I	Group II	P-value
Appropriate Specimen Culture	64	75	0.51
Blood Culture	23	42	0.82

in group I and II respectively, blood infection in 15% and 20% in group I and II respectively and soft issue infection in 8% and 15% in group I and II respectively. It is important to recognize the influence that pathogens exert on the outcomes in septic shock. Even in the setting of choosing appropriate antibiotics, pathogen-related characteristics can affect sepsis pathogenesis and prognosis. Each pathogen has an intrinsic set of virulence factors that affect host response to infection and outcomes.[12] Identification of these virulence factors in the clinical setting has the potential to allow a better understanding of the outcomes associated with these infections, and possible to develop novel therapies aimed at negating the influence of the virulence factors.

Conclusion

The authors found that clinical features and co-morbidities were higher in ICU patients as compared to the medical ward.

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