



A STUDY ON SEPSIS – CLINICAL AND BIOCHEMICAL PROFILE AND A CORRELATION STUDY

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ABSTRACT

Background: Septic response is a leading contributory factor for morbidity and mortality especially in intensive care settings. Recent data suggests that the incidence of sepsis worldwide is on the rise and at the same time the mortality rate remained high despite the ongoing advances in the management of sepsis.

Objectives: To study the pattern and outcome of the patients with sepsis. To grade the patients with sepsis based on consensus conference criteria-sepsis, severe sepsis and septic shock and study each grade of sepsis within the group of patients. To find the occurrence of positive blood culture among the different grades of sepsis. To assess the type of organ dysfunction commonly encountered. To evaluate the outcome during the hospital stay.

Methods: It's a Prospective study, 50 subjects were recruited from ASRAM MEDICAL COLLEGE AND HOSPITAL MEDICAL INTENSIVE CARE UNIT in the department of general medicine who fulfill the criteria for sepsis according to consensus conference criteria i.e. systemic inflammatory response syndrome caused by infection as underlying etiology (or) at least clinical evidence of infection. The study was approved by institutional ethical committee. A written informed consent was taken from all the patients. Blood sample for bacterial culture / sensitivity was collected and sent soon after a diagnosis is made.

Results: The incidence of the disease in our study group was found to be high in elderly patients between 65-74 year age group with predominant involvement of 74% males and 26% females, with a mean age of 54.68 years. 40% were diagnosed to have sepsis, 44% had severe sepsis and 16% with septic shock. The mortality rate is nil for sepsis to 31.8% in severe sepsis and 75% in patients with septic shock. Overall mortality of 26% in our patients at the end of 28 days of follow up from the date of diagnosis of sepsis

Conclusion: The prognosis was good in initial stages of sepsis, but was grave with septic shock (75% mortality). Hence early recognition and prompt management of sepsis is of paramount importance.

KEYWORDS : Septic response; Septic shock; severe sepsis.

INTRODUCTION:

Septic response is a leading contributory factor for morbidity and mortality especially in intensive care settings. Recent data suggests that the incidence of sepsis worldwide is on the rise and at the same time the mortality rate remained high despite the ongoing advances in the management of sepsis. Partly this is attributable to the aging of the population, increasing longevity of patients with chronic diseases, indwelling catheters, misuse of antimicrobials and mechanical devices.

This study is an attempt to understand the scenario of sepsis in our hospital.

AIMS AND OBJECTIVES:

1. To study the pattern and outcome of the patients with sepsis.
2. To grade the patients with sepsis based on consensus conference criteria-sepsis, severe sepsis and septic shock and study each grade of sepsis within the group of patients.
3. To find the occurrence of positive blood culture among the different grades of sepsis.
4. To assess the type of organ dysfunction commonly encountered.
5. To evaluate the outcome during the hospital stay.

MATERIALS AND METHODS:

This study includes 50 patients admitted at ASRAM MEDICAL COLLEGE AND HOSPITAL MEDICAL INTENSIVE CARE UNIT.

Type of study: Prospective study

Duration of study: September 2014 – August 2016

Inclusion Criteria:

1. All patients > 15 yrs who fulfill the criteria for sepsis.
2. All patients with or without underlying organ dysfunction on admission will be taken into consideration.

Exclusion Criteria:

1. Patients with no evidence of infection

Methodology:

Study subjects were recruited from the outpatient block in the department of general medicine in ASRAM medical college Eluru. The study was approved by institutional ethical committee. A written informed consent was taken from all the patients.

Collection of data:

Data was collected from 50 patients. The criteria for selection is any patient admitted in Intensive Care Unit who fulfill the criteria for sepsis according to consensus conference criteria i.e. systemic inflammatory response syndrome caused by infection as underlying etiology (or) at least clinical evidence of infection. Blood sample for bacterial culture / sensitivity was collected and sent soon after a diagnosis is made. Complete data was obtained during the stay in the hospital and will be followed up for a total of 28 days from the time of diagnosis which includes the hospital stay, follow up visit or death. The onset of severe sepsis and septic shock will be assessed during hospital stay.

Statistical software: Statistical analysis was performed using the statistical software (SPSS for windows, ver. 20.0 trail). Microsoft word and Microsoft excel had been used to generate graphs and tables.

Statistical analysis: Data was analyzed using chi-square test. p value of < 0.05 was considered significant. Descriptive statistics were used to find out frequency of distribution.

DISCUSSION:

The observation made in 50 cases with sepsis admitted in the Intensive Care Unit of ASRAM Medical College Hospital, Eluru from September 2014 to August 2016 is discussed.

1. Age and Sex: The incidence of the disease in our study group was found to be high in elderly patients between 65-74 year age group with predominant involvement of 74% males and 26% females, with a mean age of 54.68 years.

The observation noted above is in concordance with Guidet and associates¹ in their study on sepsis and organ dysfunctions who observed that the incidence of sepsis steeply increases above the age of 50 years and frequently involving men.

Flatten² observed that the mean age for incidence was 57.9 years.

Gestel³ and colleagues in their observation in Dutch ICU's found that 70% of the patients were older than 60 years and male to female ratio was 1:7.

2. Grading of Sepsis: Silva et. al.⁴ in their study involving 1383 patients with sepsis found that the incidence of sepsis was found in 46.9%, severe sepsis in 27.3% and septic shock in 23% with a mortality rate of 34.7% for sepsis, 47.3% in severe sepsis and 52.2% with patients in septic shock.

Flatten² in his analysis of data from patients in various ICU's in Norway in 1999 identified 6,665 patients with sepsis of them 2,121 patients had severe sepsis and the mortality rate is 15% for uncomplicated sepsis and 31.8% in severe sepsis.

Prem Sundar Batham⁵ cross sectional study 2015 patients with only sepsis had 100% recovery, while 92.31% severe sepsis recovered, 7.69% expired and those with septic shock 72.3% recovered and 27.27% expired.

In our study of 50 patients with sepsis, 40% were diagnosed to have sepsis, 44% had severe sepsis and 16% with septic shock. The mortality rate is nil for sepsis to 31.8% in severe sepsis and 75% in patients with septic shock.

3. Organ Dysfunction in Sepsis: In all the studies quoted above the frequency of organ failure was associated with the severity of the disease and adverse outcome.

Hugonnet et al.⁶ in their retrospective study found respiratory (63%) as the most common organ dysfunction, followed by neurological (41%) and renal (35%).

Guidet et al.¹ in their observation concluded respiratory followed by circulatory and renal dysfunction as the common organs to be involved. They also noted that number of organ dysfunctions in a given patient is proportional to the mortality rate as no organ involvement is associated with 5.5% mortality, for single organ involvement with 10.5% and two organ involvement with 42.7% mortality.

Our observations revealed that the common organs to get involved are renal (30%) followed by CVS (28%), respiratory (26%), hepatic (18%). Mortality rate is nil for no organs involved to 16.7% for single organ dysfunction, 57.1% in two organ dysfunction and 100% mortality in 3 or 4 organ dysfunctions encountered.

4. Blood Cultures: In our study we found 32% of our patients with a positive blood culture with predominant Gram negative growth, Pseudomonas and E.coli being the most common organisms and Staphylococcus aureus the common Gram positive organism.

Whereas Hugonnet et al.⁶ in their observation comparing two groups of patients with sepsis during 80's and 90's concluded that spectrum of organisms in blood culture has changed from predominant Gram negative in the 80's to Gram positive in 90's and positive blood cultures from 21% in 80's to 47% in 90's.

But Guidet et al.¹ observed positive blood cultures in 32.2% of patients with sepsis with Pseudomonas being the predominant Gram negative organism and Staphylococcus the Gram positive organism which is in agreement with our observation.

Flatten² in his observation of 6,665 patients with sepsis found 31.8% of them with positive blood culture.

In 2013 a study in an Indian tertiary care hospital⁷ was done staphylococcus aureus is the significant cause of case fatality compared to other organisms

Prem sundar Batham⁵ study has 26% positive blood cultures and 7.4% had no organism grown in blood culture.

5. Focus of Infection: The study conducted by Silva et al.⁴ concluded that the main source of infection was respiratory tract (65.6%) followed by urinary tract (5.6%), abdominal/surgical wound (4%), blood stream (2.5%) and unknown sites (21.4%).

Gestel³ and associates in their observation in Dutch Intensive Care Units concluded that the most common site of infection were the lungs 47% and the abdomen 34%.

Guidet et al.¹ in their study of sepsis and organ dysfunction concluded that the common foci of infection is the respiratory tract followed by abdomen and cardiovascular.

Prem sundar batham⁵ cross sectional study concluded the common source of infection is respiratory followed by urinary tract.

In our study we observed that the respiratory tract was the most common source of infection (50%), followed by urinary tract (10%), skin and abdomen (15%) and intravenous catheter related infection in (04%) of the studied group.

6. Frequency of Underlying Illness: Silva et al.⁴ during their study of sepsis have found that the frequency of chronic diseases coexisting are as follows: Hypertension in (38.1%), Diabetes (21.7%), Malignancy (18.3%), COPD (14.0%), Chronic Renal Failure (7.5%), Liver cirrhosis (4.3%) and CCF (4.1%).

Gestel³ and their associates in their study observed that diabetes, chronic heart failure, history of cerebrovascular accidents and chronic kidney disease were commonly seen in patients with sepsis.

Our study revealed diabetes (28%), hypertension (24%), pulmonary tuberculosis (12%), COPD (08%), chronic renal failure (06%), CVA (04%) and carcinoma bronchus (04%) as the common underlying illness in patients with sepsis.

7. Duration of stay in Hospital: Silva et al.⁴ in their observation noted that the average I.C.U. stay for patients with sepsis is 4 days duration (2-9) days.

Flatten² in his analysis found that the mean hospital stay for patients with sepsis is 14.9 days.

Gestel.³ and his colleagues found that the average stay in hospital is

13.3 + 1.1 day in patients with severe sepsis.

Our patients with sepsis had an average of 9.24 days hospital stay.

8. Final Outcome: Silva et al⁴ in their study observed a mortality of 21.8% at the end of 28 days.

Hugonnet⁶ and associates noted a 28th day mortality of 37% in their study of patients with sepsis.

In our study, we came across an overall mortality of 26% in our patients at the end of 28 days of follow up from the date of diagnosis of sepsis.

CONCLUSION:

In this study we concluded that most of the clinical observations were in accordance with other studies conducted earlier. However we found disproportionately higher incidence among males and elderly. Positive blood cultures were found in 32% of patients which are predominantly gram negative organisms. The common organ failure we encountered was renal, which is in contrast to other studies wherein respiratory failure was frequently encountered. The common source of infection is respiratory tract followed by urinary tract. The average duration of hospital stay was 9.24 days with a mortality rate at 28 day follow up as 26%.

The prognosis was good in initial stages of sepsis, but was grave with septic shock (75% mortality). Hence early recognition and prompt management of sepsis is of paramount importance.

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