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# EVALUATION OF SEPSIS RECOGNITION AND EARLY MANAGEMENT PRACTICES IN THE EMERGENCY DEPARTMENT OF CIVIL HOSPITAL JAMSHORO, SINDH, PAKISTAN

**Muhammad Rashid[*1], Ahsan Ali Memon[2], Maria Ishaque[3], Syeda Muazzama Fatmi[4], Riffat Ghumman[5], Mah'd Musa Eid Abu Dhair[6]**

[*1]*Faculty of Pharmacy, University of Sindh, Jamshoro, Sindh, Pakistan.*
[*1]*Asian International University, Kyrgystan.*
[2,3]*College of Pharmacy, Liaquat University of Medical and Health Sciences, Jamshoro, Sindh, Pakistan.*
[4]*Department of Pharmaceutical Chemistry, Faculty of Pharmacy, Jinnah University for Women, Karachi, Sindh, Pakistan.*
[5]*People's Institute of Dental and Oral Health Sciences, People's University of Medical and Health Sciences for Women, Nawabshah, Sindh, Pakistan.*
[6]*Department of Pharmacy Practice, Faculty of Pharmacy, University of Sindh, Jamshoro, Sindh, Pakistan.*

[*1]drrashidnaseeb@gmail.com

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*Sepsis, Emergency Department, Early Recognition, Antibiotic Administration, Sepsis Bundle, Pakistan, Emergency Medicine*

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**Corresponding Author: ***
**Muhammad Rashid**

## Abstract

***Background***

*Sepsis occurs as an important cause of morbidity and mortality worldwide and accounts for great financial burden of healthcare, especially, in developing nations. Early identification and prompt performance of evidence-based management strategies in Emergency Department should yield better results in terms of health outcomes. Nonetheless, diagnosis and treatment delays are typical of resource-poor environments.*

***Objective***

*The aim of this study was to assess practices of recognition and early prevention of sepsis in patients with suspected condition admitted to Emergency Department of Civil Hospital Jamshoro in Sindh province of Pakistan.*

***Methodology***

*The study conducted in Emergency Department of Civil Hospital Jamshoro from January 2025 till June 2025 represented a descriptive cross-sectional research design. Patients above 18 years of age were recruited in the study based on inclusion criteria allowing to screen the cases of suspected sepsis. Structured proformas were used to collect patient demographic data, sepsis symptoms, diagnosis and treatment options practiced, as well as interventions performed and outcomes achieved monitoring. The SPSS version 26 was employed to analyze the results in order to find out frequencies, percentages, means and standard deviations.*

***Results***

*A total of 220 patients with suspected sepsis were enrolled. The mean age was 52.8 ± 17.4 years. A total of 220 patients suspected of having sepsis were studied. The mean or average age of patients was 52.8 ± 17.4 years. The diagnosis of sepsis was made during the first assessment in the Emergency*

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*Department (ED) in 154 (70.0%) cases. Of the 220 patients included in the study, 136 (61.8%) underwent testing for lactate while blood cultures were taken from 124 (56.4%) patients before antibiotics were administered. Broad-spectrum antibiotics were administered within one hour to 118 (53.6%) patients. The corresponding number of patients who completed the whole process of intravenous fluid resuscitation according to the guidelines was 143 (65.0%). In 18.6% of cases where antibiotics were administered within 1 hour, the mortality rate in the adult ED was significantly lower than in the patients who did not receive antibiotics in time (34.3%); P=0.011. Overall, in-hospital mortality reached 26.4%.*

***Conclusion***

*Although the rates of diagnosis of sepsis in the study were acceptable, there are important gaps in complying with the recommended procedures for early curing patients with sepsis. Delays in administering antibiotics, inadequate culture taking, and incomplete implementation of the sepsis diagnosis protocols resulted in the poor quality of care. It is necessary to work on the sepsis detection system, training of personnel, and protocol-based management.*

## INTRODUCTION

Sepsis refers to a life-threatening damage to organ systems due to the overwhelming response of the human body to infections. It is one of the major causes of death in the world today because millions of people die from it every year. Although the treatment of critical illnesses and infectious diseases has improved significantly, sepsis remains one of the most critical medical problems that need to be solved especially in developing nations [1,2].

Emergency departments are the first places where sepsis patients contact with the medical workers. Timely diagnosis of sepsis is very important because delay in diagnosis and treatment has always led to increased death rates, prolonged stay in hospitals, and the increased costs of treatment. The guidelines of the Surviving Sepsis Campaign explain that patients should be diagnosed as soon as possible at the emergency departments, their serum and lactate levels should be measured, blood samples should be collected, and the antibiotics should be administered [3].

Numerous studies have shown that strict adherence to the sepsis treatment protocols greatly reduces the risk of death in septic patients. However, emergency departments of low-resource countries often face a lot of problems such as overcrowded departments, inadequate medical equipment, and misqualified personnel that influence their adherence to the requirements of treatment protocol [4].

In Pakistan, information is limited concerning sepsis identification and management processes. Most tertiary hospitals have no available data to evaluate compliance with the sepsis protocol set by global standards. Thus, it is crucial to assess practices at the Civil Hospital Jamshoro in order to pinpoint weaknesses and develop plans for rectifying them. This study aims to assess the recognition and management of sepsis in the Emergency Department of Civil Hospital Jamshoro.

## METHODOLOGY

### Study Design

Descriptive cross-sectional study.

### Study Setting

Emergency Department, Civil Hospital Jamshoro, Sindh, Pakistan.

### Study Duration

January 2025 to June 2025 (6 months).

### Study Population

The study is focused on adult patients who get evaluated in the emergency department for suspected sepsis.

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**Inclusion Criteria**

- Age of 18 or older
- Existence of suspected infection
- Clinical markers of sepsis identifiable as per the Sepsis-3 classification

**Exclusion Criteria**

- Patients who refuse treatment
- Patients having undergone surgical treatment prior to admission
- Patients with incomplete clinical information
- Patients with diagnosis and treatment elsewhere

**Sample Size Calculation**

The sample size was calculated using the formula meant for determining a simple proportion [5]:

$n=Z^2P(1-P)/d^2$

Where:

- n = required sample size
- Z = 1.96 (95% confidence interval)
- P = 0.70 (estimated sepsis recognition rate based on previous studies)
- d = 0.06 (margin of error)

Substituting values:

$n = (1.96)^2 \times 0.70 \times (0.30) / (0.06)^2$

$n = 224$

The final sample was estimated having around 220 patients after considering the possibility of the incomplete records.

**Data Collection Procedure**

Patients were selected after they fulfilled the inclusion criteria at the time they were admitted to the emergency department. Data was collected through an organized survey and assessment of patients' medical records. Data included:

- Demographic characteristics
- Vital signs
- Source of infection
- qSOFA parameters
- Timing of sepsis recognition
- Lactate measurement
- Blood culture collection
- Antibiotic administration
- Fluid resuscitation
- ICU admission
- Mortality outcome

**Data Analysis**

The collected data was analyzed with the help of SPSS version 26.

Descriptive statistics included:

- Mean ± SD for quantitative variables
- Frequencies and percentages for categorical variables

Inferential statistics:

- Chi-square test
- The p-value below 0.05 shows that the result is statistically essential

## RESULTS

**Table 1: Demographic Characteristics (n=220)**

| Variable | Frequency | Percentage% |
|---|---|---|
| Male | 128 | 58.2 |
| Female | 92 | 41.8 |
| Age 18–40 years | 54 | 24.5 |
| Age 41–60 years | 92 | 41.8 |
| Age >60 years | 74 | 33.7 |

*Mean age = 52.8 ± 17.4 years.

**Interpretation**

It was reported that most of the patients were men (58.2 %), mostly aged between 41 and 60 years, which means that most patients with sepsis consist of older people and middle-aged individuals.

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**Table 2: Sources of Infection**

| Source | Frequency | Percentage% |
|---|---|---|
| Pneumonia | 72 | 32.7 |
| Urinary Tract Infection | 48 | 21.8 |
| Intra-abdominal Infection | 39 | 17.7 |
| Skin/Soft Tissue Infection | 26 | 11.8 |
| Bloodstream Infection | 19 | 8.6 |
| Other | 16 | 7.4 |

**Interpretation**

The most frequent source of sepsis is pneumonia (32.7%). The second most common cause of sepsis is urinary tract infection (21.8%). This phenomenon means that which exists already on a global scale and pneumonia and other respiratory infections are the most frequent conditions leading to development of sepsis.

**Table 3: Sepsis Recognition Practices**

| Variable | Frequency | Percentage% |
|---|---|---|
| Recognized at triage | 96 | 43.6 |
| Recognized during physician assessment | 58 | 26.4 |
| Delayed recognition | 66 | 30.0 |

**Interpretation**

In 70% of cases sepsis was diagnosed quite early and only third were diagnosed late that leads to lower frequency of good outcomes.

**Table 4: Compliance with Early Sepsis Bundle**

| Intervention | Frequency | Percentage% |
|---|---|---|
| Lactate measured | 136 | 61.8 |
| Blood cultures before antibiotics | 124 | 56.4 |
| Antibiotics within 1 hour | 118 | 53.6 |
| IV fluids administered appropriately | 143 | 65.0 |
| Complete bundle compliance | 92 | 41.8 |

**Interpretation**

Low compliance was documented in the studied sepsis bundle components. Only 41.8% of patients were treated with all of the related elements within the required time.

**Table 5: Time to Antibiotic Administration**

| Time Interval | Frequency | Percentage% |
|---|---|---|
| ≤1 hour | 118 | 53.6 |
| 1–3 hours | 64 | 29.1 |
| >3 hours | 38 | 17.3 |

**Interpretation**

Only a bit about 50% of patients received their antibiotics in time (during the first hour since the start of treatment). There was a delay in 17.3% of cases.

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**Table 6: Clinical Outcomes**

| Outcome | Frequency | Percentage% |
|---|---|---|
| Discharged after recovery | 110 | 50.0 |
| Ward admission | 52 | 23.6 |
| ICU admission | 34 | 15.5 |
| Death | 58 | 26.4 |

**Interpretation**

The overall mortality was 26.4%, indicating the high severity of sepsis.

**Table 7: Association Between Antibiotic Timing and Mortality**

| Antibiotic Timing | Survived | Died | Mortality % |
|---|---|---|---|
| ≤1 hour | 96 | 22 | 18.6 |
| >1 hour | 66 | 36 | 34.3 |

*Chi-square = 6.49

*p = 0.011

**Interpretation**

It was shown that the patients receiving their antibiotics in the first hour of treatment had lower mortality rates compared to those sent for antibiotics later.

## DISCUSSION

The current research assessed the awareness and implementation of sepsis awareness and management procedures within the Emergency Department of Civil Hospital Jamshoro. The figure of 70% is suggestive of a good level of sepsis awareness among the practitioners in this area. However, the rate of sepsis identification in 30% patients indicates that the aspect ought to be improved.

Compliance with the various components of the sepsis bundle remains below the globally acceptable levels. For example, only 53.6% of patients were initiated on antibiotic therapy within one hour and only 56.4% had their blood cultures done prior to the commencement of antibiotic treatment. In fact, similar observations have already been made in various developing countries where overcrowding and lack of sufficient workforce and resources hinders the application of the recommended sepsis protocols [6-8].

The mortality rate of 26.4% calculated in the present study is in line with the figures obtained from some tertiary hospitals within the region. However, the most important point is that the administration of antibiotics on time can help increase the patient survival rate, thus supporting the relevance of the Surviving Sepsis Campaign [9,10].

Furthermore, the use of automated tools for sepsis screening, continuing medical education, and the implementation of specific policies in the hospital could help improve the diagnosis of this disorder and provide timely treatment.

## CONCLUSION

In conclusion, the study shows the existence of moderate recognition rate for sepsis in emergency department of Civil Hospital, Jamshoro, although compliance with recommended treatment for this condition was found to be very low. In addition, delays in antibiotics administration, failure to follow necessary treatment protocols and lack of proper diagnostics were identified as common practices found in a hospital.

**Recommendations**

Implement standardized approaches to automate sepsis screening process.

Conduct regular training sessions for the medical staff working in ED.

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Ensure access to the necessary equipment for rapid lactate measurement, blood cultures and other diagnostics.

Create a database of sepsis patients.

Implement a sepsis monitoring system.

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