

## Sepsis Occurrence and Management in Ghazi Al-Hareeri Teaching Hospital, 2017

Dr. Hala Mohammed Jawad<sup>1\*</sup> Dr. Wamedh Jalal Hameed<sup>2</sup>, Dr. Alaa Hussein Al-Taie<sup>3</sup>

1.M.B.Ch.B.

2.M.B.Ch.B \D.A\ F.I.C.M.S A & IC

3.M.B.Ch.B \ F.I.C.M.SA & IC

\* Corresponding Author [halamdrm@gmail.com](mailto:halamdrm@gmail.com)

Original Article

### Abstract

**Background:** Sepsis is a clinical syndrome resulting from the presence of both an infection and a systemic inflammatory response syndrome. It represents a significant public health burden

**Objective:** To recognize the cases of sepsis in Ghazi Al Hareeri Teaching Hospital during 2019 and to evaluate the causes, management done for such cases and their outcome

**Methods:** A cross sectional study that was done in Al-Shaheed Ghazi Al-Hareeri hospital, data was collected from the archived files in the hospital during 2019, 100 cases were reported in this period who was diagnosed and admitted as sepsis or who was admitted with other diagnosis and then develop sepsis.

**Results:** In this study, one third of the patient who diagnosed as sepsis were admitted to the ICU, the mean duration of initiation of management 15.8 days. Also, we found that death occur in more than half of the patients and death were prevalent among older patients, severe sepsis, and patients with negative blood culture. Finally, we found that admission to the ICU from units other than emergency or ICU itself found is nearly one third of the patient were diagnosed as sepsis and the respiratory system was commonly involved and presented as pneumonia

**Conclusions:** Mortality rate is still high in patients who diagnosed as sepsis in the hospital, the most common source of admission was from other units in the hospital. The older age, sever sepsis and negative blood culture are closely associated with death.

**Keywords:** Sepsis, management of sepsis, sepsis in ICU.

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## **1. INTRODUCTION**

Sepsis is life-threatening organ dysfunction due to a dysregulated host response to infection and is an important global health problem (1). Although the consensus definition for septic shock requires, frank hypotension however, some have argued that evidence of hypo perfusion such as an elevated blood lactate  $\geq 4$ mmol/l. Should also be regarded as shock (2). Many epidemiologic studies have reported that the incidence of sepsis has dramatically increased over the past several decades while mortality rates have fallen (3, 4). The global epidemiological burden of sepsis is, however, difficult to ascertain. It is estimated that more than 30 million people are affected by sepsis every year worldwide, resulting in potentially 6 million deaths annually (5). Sepsis is quite important as it is seen in 10 of 1000 hospitalized patients and multiple organ dysfunction syndrome (MODS) develops in 30% of these patients; mortality is observed in 20% of patients with sepsis and 60–80% of patients with septic shock. Early diagnosis and treatment are necessary due to high mortality rates (6). Several hospital-based studies report varying hospital and intensive care unit (ICU) occurrence rates, ranging from 2% to 11% of all hospital and ICU admissions (7). The occurrence of clinical findings is usually insidious. They can occur in the form of fever, mental fog, temporary hypotension, decreasing urine amount, or unexplained thrombocytopenia. If necessary actions are not taken or if sepsis is not treated, respiratory and renal failure, coagulation disorders, and irremediable hypotension can develop (8). The success of the treatment in sepsis depends on early diagnosis, immediately starting the appropriate antibiotic treatment and supporting treatment, and elimination of or recovery from the underlying disease. Protection is the most important way of reducing morbidity and mortality rates. Most of the attacks are nosocomial (9). With an increasing incidence, high mortality, and staggering annual cost, sepsis will place a significant burden on the Iraq health care system in the coming years. The aim of our study is to recognize the cases of sepsis in Ghazi Al Hareeri Teaching Hospital during 2019 and to evaluate the causes, management done for such cases and their outcome.

## **2. PATIENTS and METHODS**

Study design, setting, and time: This was a cross-sectional study conducted in Al-Shaheed Ghazi Al-Hariri for Specialized Surgery Teaching Hospital, Baghdad, Iraq during a period of four months from (October 2019 to February 2020). Study Population and sample size: This

study involved 100 patients who admitted to Al-Shaheed Ghazi Al-Hariri for specialized surgery Teaching Hospital during 2019 either diagnosed as sepsis or admitted due to other causes and developed sepsis after admission. The data was collected from the archived files in the hospital. Any archived file reported a diagnosis of sepsis during 2019 was included in this study. Cases of neonatal sepsis were excluded from the study. The data was collected by a paper including information about sepsis, taken from an archived files and filled by the researcher. It included socio-demographic characteristics (Age, gender, and residence), source of admission which classified as emergency room, other units, and ICU with other diagnosis, diagnosis which classified as SIRS, sepsis, severe sepsis, and septic shock, site of infection which classified as pneumonia, urinary tract infection, abdominal, meningitis, skin, bone, wound, catheter, endocarditis, device, and other sites, duration of initiation of management, ICU admission, investigation details, treatment received, blood culture result: positive or negative, and fate: Either cure or death. Statistical analysis: Statistical analysis was performed using SPSS windows version 26 Software. The data presented as mean, standard deviation and ranges. Categorical data presented by frequencies and percentages. Chi square and Fisher's exact probability test were used to test qualitative and frequency data. P value < 0.05 was considered significant.

### 3. RESULTS

In this study, the age of patients was ranging from 16 to 78 years with a mean of  $59.43 \pm 8.3$  years; 56% of them were males; 76% were living in Baghdad; and 36% were admitted from emergency department. The most common diagnosis was sepsis (38%) followed by SIRS (32%); the most common infection detected was pneumonia followed by wound infection (26% and 24% respectively). More than two thirds of patients (68%) were admitted to ICU; 76% of them were managed for less than month; and 50% showed isolated microorganism in blood culture as shown in (**Table 1**). Regarding management, all study patients were received I.V. fluid and antibiotics and 86% were received blood and/or plasma as shown in (**Table 2**). In this study, 55% of study patients died and 45% survived, (**Figure 1**). The association between outcome and other variables is shown in (**Table 3**). We noticed that the highest prevalence of death was seen significantly ( $P= 0.001$ ) among older patients (72.5% of those aged  $\geq 60$  years were died), who had negative results in blood culture (70.5%) with a significant association ( $P= 0.001$ ) between prevalence of death and blood culture result. Regarding diagnosis, the highest

prevalence of death was seen among patients diagnosed with severe sepsis (83.3%) with a significant association (P= 0.001) between mortality and diagnosis. No significant association (P=0.14) between prevalence of death and source of admission.

Table 1. Distribution of study patients by certain characteristics (n= 100)

Variable	No.	%	
Age (Year)	< 20	8	8.0
	20 - 39	21	21.0
	40 - 59	31	31.0
	≥ 60	40	40.0
Gender	Male	56	56.0
	Female	44	44.0
Residence	Baghdad	76	76.0
	Outside Baghdad	24	24.0
Source of admission	Emergency	36	36.0
	ICU with other diagnosis	2	2.0
	Other	62	62.0
Diagnosis	Systemic Inflammatory Response Syndrome (SIRS)	32	32.0
	Sepsis	38	38.0
	Severe sepsis	18	18.0
	Septic shock	12	12.0
Site of infection	Pneumonia	26	26.0
	Wound	24	24.0
	Skin	20	20.0
	Abdominal	18	18.0
	Meningitis	10	10.0
	UTI	8	8.0
	Bone	4	4.0
	Infection	4	4.0
	Catheter	4	4.0
Other infection	6	6.0	
ICU admission	Yes	68	68.0
	No	32	32.0
Duration of management	< Month	76	76.0
	≥ Month	24	24.0
Blood culture result (n= 88)	Isolated microorganism	44	50.0
	No growth	44	50.0

Table 2. Distribution of study patients according to the management

Treatment	Number of patients	%
I.V. Fluid	100	100.0
Antibiotic	100	100.0
Steroid	34	34.0
Diuretics	26	26.0
Antiemetic	66	66.0
Anti-coagulant	18	18.0
Blood and/or plasma	86	86.0
Analgesia	78	78.0
Antihypertensive	8	8.0
Albumin	32	32.0

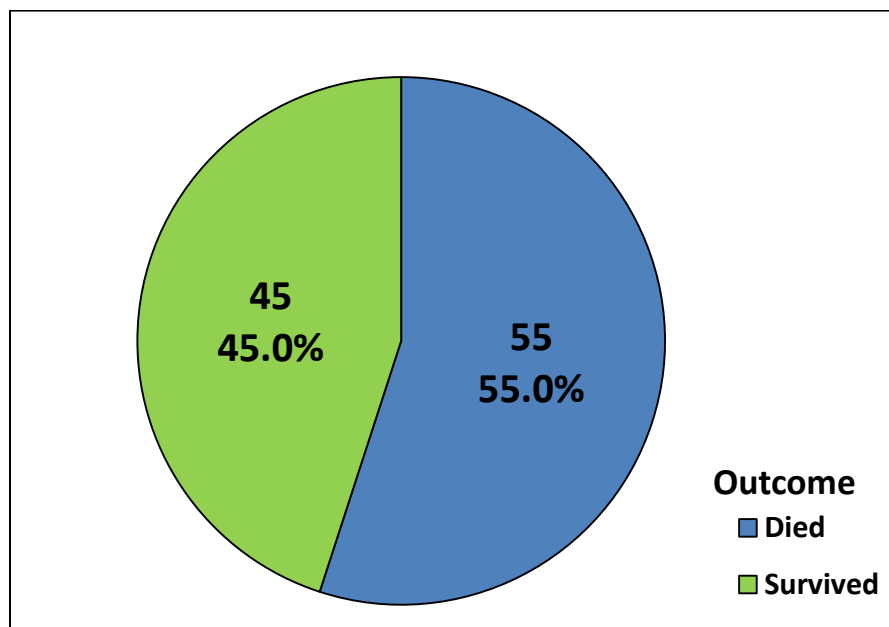


Figure 1. Distribution of the outcome of patients

Table 3. Association between outcome and certain details

Variable	Outcome				Total		P. value	
	Dead (n= 55)		Cure (n= 45)					
	No.	%	No.	%	No.	%		
Age (Year)	< 20	1	12.5	7	87.5	8	8.0	0.001
	20 - 39	5	23.8	16	76.2	21	21.0	
	40 - 59	20	64.5	11	35.5	31	31.0	
	≥ 60	29	72.5	11	27.5	40	40.0	
Source of Admission	Emergency	23	63.9	13	36.1	36	36.0	0.14
	ICU	2	100	0	0	2	2.0	
	Other units	30	48.4	32	51.6	62	62.0	
Diagnosis	SIRS	8	25	24	75	32	32.0	0.001
	Sepsis	23	60.5	15	39.5	38	38.0	
	Severe Sepsis	15	83.3	3	16.7	18	18.0	
	Septic Shock	9	75	3	25	12	12.0	
Blood culture result n=88	Micro-organism isolated	15	34.1	29	65.9	44	50.0	0.001
	No Growth	31	70.5	13	29.5	44	50.0	

#### 4. DISCUSSION

Despite the advances in medical therapeutics, sepsis, severe sepsis and septic shock remain the leading cause of morbidity and mortality in ICUs (10). Not surprisingly, the incidence and mortality rates widely vary throughout the world, and significant differences in the pattern of causative micro-organisms and infection sites have been observed (11). These facts reflect the importance of local epidemiological studies on sepsis to increase our knowledge about sepsis features in different areas and healthcare systems in order to improve patient care and prognosis (12). In this study, more than half of the current study’s patients died (55%) with detection of significant associations with age, severe sepsis and negative blood culture results. Association of increased mortality rate with older age in patients with sepsis might be due to two reasons. First, increased age is associated with decreased lymphocyte function, causing weakened immune responses. This is compounded by poor nutritional status and altered cytokine response. The second possibility is that older patients have more comorbidities (itself an independent risk factor for death from sepsis) (13). Higher mortality rate was observed in

studies conducted by Tanriover MD et al in Turkey in 2006 (14) and by Huang CT et al in Taiwan in 2015 (15) when reported that 87.3% and 61% died during the hospital stay respectively. Lower rates were noticed in studies conducted by Zhou J et al in china in 2014 (16) and by Finfer S et al in Australia and New Zealand in 2004 (17) when reported that 28.7% and 37.5% died during the hospital stay respectively. These discrepancies in results might be explained by many factors as: patient age, variation in the definition of severe sepsis, comorbidities, sites and types of infection, involved microorganisms, principles of antimicrobial therapy, severity of organ dysfunction, the severity of acute illness might be different and patients with ICU-acquired sepsis had a higher mortality. In this study, the respiratory system was the commonly involved and presented as a pneumonia in 26% of the study's patients which is agreed with Tanriover MD et al study in 2006 (14) and Huang CT et al study in 2015 (15) and different from a study conducted by Sadaka F et al in 2015 when reported that traumatic brain injury and intracranial hemorrhage complicated by sepsis were the commonest source of sepsis (18). Potentially effective improvements include earlier antibiotic administration, increased use of early goal directed therapy, improvements in mechanical ventilation strategies or increased intensivist staffing (19). In order to most efficiently target quality improvement interventions, future studies should seek to determine which practice patterns are most strongly associated with outcome improvements in severe sepsis. In conclusion, mortality rate is still high in patients who diagnosed as sepsis in the hospital, most common source of admission was from other units in the hospital, and age, severe sepsis, and negative blood culture findings were significant risk factors of death in patients with sepsis.

## **5. CONCLUSIONS**

Mortality rate is still high in patients who diagnosed as sepsis in the hospital, the most common source of admission was from other units in the hospital. The older age, sever sepsis and negative blood culture are closely associated with death.

### **Ethical Clearance:**

Ethical issues were taken from the research ethics committee. Informed consent was obtained from each participant. Data collection was in accordance with the World Medical Association

(WMA) declaration of Helsinki for the Ethical Principles for Medical Research Involving Human Subjects, 2013 and all information and privacy of participants were kept confidentially.

**Conflict of interest:** Authors declared none.

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