ORIGINAL ARTICLE

EVALUATION OF EFFECTIVE MANAGEMENT OF SEPSIS IN EMERGENCY DEPARTMENT IN SUEZ CANAL UNIVERSITY HOSPITAL, EGYPT

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ABSTRACT

Introduction: Sepsis is a syndrome has especial characters by systemic inflammation due to infection. There is a severity ranging from sepsis to severe sepsis and septic shock. More than 1,665,000 cases of sepsis diagnosis in the United States each year, with a mortality rate of 50%. Interventions to be completed within 6 hours of triage are better to use vasopressors, measure of CVP and ScvO2, and use of targets for quantitative resuscitation. Emergency physicians performance improvement efforts to improve patient outcomes in severe sepsis.

Aim: To improve the outcome in patients with sepsis attending emergency room in Suez Canal University in the period from 1-11-2014 to 1-4-2015.

Methodology: Descriptive study, where every case of sepsis presented to the department of Emergency medicine at Suez Canal University Hospital that met the inclusion criteria, had been included in the study

Results: This study revealed that the mean age of studied patients was 66.38± 13.34 with a wide range of (28-90). Our study showed that (88%) of the patients received antibiotic within the first three hours. none of them obtained blood culture. (81%) of the patients received fluid resuscitation therapy within the first three (65.5%) of them received ≥ 30 mL/kg loading fluid within 3 hours of sepsis diagnosis.

Conclusion: The results revealed adherence of ER physicians to guidelines at Emergency Department in Suez Canal University Hospital. Most of the studied patients followed the SSC guidelines.

Keywords: Management, sepsis, SIRS.

INTRODUCTION

Sepsis is a syndrome characterized by a systemic inflammatory reaction to infection. There is a severity range from sepsis to severe sepsis and septic shock. More than 1,665,000 cases of sepsis occur in the United States each year, with a mortality rate of 50 %.[1]

Uniform definitions developed over years from the sepsis syndrome, including the systemic inflammatory response syndrome (SIRS), sepsis, severe sepsis and septic shock. SIRS characterized by the clinical aspects derived from an acute yet nonspecific illness, whereas an infectious etiology is required for the diagnosis of sepsis. As sepsis progresses, organ system dysfunction becomes obvious (severe sepsis) with the end development of fluid refractory cardiovascular dysfunction (septic shock).The 2012 Surviving Sepsis Campaign which includes a sepsis care bundle. Interventions to be completed within 3 hours of tri-

age include measuring lactate levels, obtaining blood sample for cultures before giving broad-spectrum antibiotics (within 45 minutes), and giving 30 mL/kg of crystalloid for hypotension or for lactate levels at least 4 nmol/L.[2]

Interventions to be completed within 6 hours of triage are better to use vasopressors, measurement of CVP and ScvO2, and use of targets for quantitative resuscitation. Emergency physicians' performance improvement efforts to improve patient outcomes in severe sepsis.[2]

Sepsis is a syndrome has especial characters by systemic inflammation due to infection. There is a severity ranging from sepsis to severe sepsis and septic shock,Interventions to be completed within 6 hours of triage are better to use vasopressors, measure of CVP and ScvO2, and use of targets for quantitative resuscitation. Emergency physician's performance

improvement efforts to improve patient outcomes in severe sepsis. [1]

METHODOLOGY

This descriptive study included 32 patients attended emergency room in Suez Canal university hospital that with the following inclusion criteria: Adult,≥ 18 years , both sexes, diagnosed to have SIRS according to SSC guidelines: Hyperthermia more than 38.3°C or Hypothermia less than 36°C, tachycardia more than 90 bpm, leucocytosis (more than 12,000 µL-1) or Leukopenia (less than 4,000 µL-1) or >10% bands , tachypnea more than 20 bpm , diagnosed to have sepsis according to SSC: SIRS + infection, diagnosed to have severe sepsis according to SSC: sepsis with signs of organ dysfunction or organ hypo-perfusion: Hypotension (<90/60 or MAP <65), lactate more than 2, areas of mottled skin or capillary refill more than 3 seconds, creatinine more than 2.0 mg/dl, disseminated intravascular coagulation (DIC), platelet count less than 100,000

Acute renal failure or urine output less than 0.5 ml/kg/hr for at least 2 hours, hepatic dysfunction as evidenced by Bilirubin more than 2 or INR more than 1.5, cardiac dysfunction, acute lung injury or ARDS & diagnosed to have septic shock according to SSC: severe sepsis associated with refractory hypotension (BP<90/60) despite adequate fluid resuscitation and/or a serum lactate level more than 4.0 mmol/L. With exclusion criteria of children, patient known to have end organ failure, patients refused to be included in this study & immunocompromised patients or history of suppressive therapy.

Data was collected in pre-organized data sheet by the researcher; the following was performed to all included patients: Full history: with the prepared questionnaire which include data regarding age, gender, past medical history, evidence of recent infection. Clinical evaluation of the patients was be carried out on arrival to Emergency Department regarding general status, vital signs. Investigations: Laboratory investigations: hemoglobin, hematocrit, platelet count ,total white blood cells, prothrombin time, international normalized ratio, AST, ALT, bilirubin , creatinine levels ,blood urea, serum electrolytes, acetone, random blood sugar, arterial blood gases, blood culture, urine analysis and culture .Radiological investigations: chest X-ray, pelvic-abdominal ultrasound, echocardiography if needed & ECG.Then follow up was carried out: Hourly: Blood pressure, IV fluid regimen, Urine output ,Symptoms & clinical signs as vomiting, abdominal pain, hypovolemia, fever, the level of consciousness. Then, outcome: Clinically, laboratory, site of admission (inpatient or ICU). This study performed after accepted from ethical committee in faculty of medicine, Suez Canal University, Is-

mailia, Egypt and all patients were written consent for participants in this study.

RESULTS

This study revealed that the mean age of studied patients was 66.38± 13.34 with the wide range of (28-90). Our study revealed that the percentage of females with sepsis is more than males. In our study clinical variables were: heart rate (beat/ min) mean 106 (65-140) Respiratory rates (breaths/min) mean 21.75±5.66 (12-32). Temperatures (c) mean 38c (35-40). Blood pressures (mm Hg) mean 85 (130-40).

Table 1: Outcome of patients following or not following the guidelines

Guidelines	Outcome	
	Improved	Deteriorated
Follow	12	16
Not Followed	0	4

Table 2: Outcome of studied patient according to the start time of IV fluid therapy

Timing of IV Fluids infusion	Outcome	
	Improved	Deteriorated
Within the 1st 3 hrs	12	14
More than 3 hrs	0	4

Table 3: Outcome of studied patient according the amount of fluid infused

Total amount of IV fluids infusion in ml	Outcome	
	Improved	Deteriorated
30ml/kg	10	11
20ml/kg or less	0	9

Table 4: Distribution of patients according to the source of infection

Source of infection	Percentage
Chest	44%
Abdomen	6%
Urinary Tract	19%
Infected Wound	22%
Not Known	9%

Table 1shows that by following the guidelines 12 patients were improved and 16 patients were deteriorated. The table also shows that all patients that didn't follow the guidelines deteriorated.

Table 2 shows that 12 of the patient that started treatment within the 1st three hours of presentation improved while 14 of them deteriorated, and shows that all patients that started fluid therapy after 3 hours deteriorated.

Our work revealed that the most common sources of infection were lung 44%, skin 22%, urinary tract 19%, abdomen 6% and unknown source presenting 9%.Our study showed that 64% of septic shock patients improved after treatment in the emergency department. Our work showed the outcome of the patients according to their presenting complaints and it was as the following: 87.5% of the patients presented with DLOC deteriorated, 43% of patients with poor oral feeding deteriorated. Our study shows that 66.6% of septic patients with diabetes deteriorated.

Table 3 shows that 10 of patient that follow the guidelines improved while 11 of them deteriorated and show that all of patients that didn't follow the guidelines deteriorated.

Our study showed that 58.8% of hypertensive patients with sepsis deteriorated in an emergency department. Our study showed that (88%) of the patients received antibiotic within the first three hours.non of them obtained blood culture. (81%) of the patients received fluid resuscitation therapy within the first three (65.5%) of them received ≥ 30 mL/kg initial fluid challenge within 3 hours of sepsis diagnosis.In our study 12 patients improved after management at ER &20 patients deteriorated, 12 of studied patients followed the guidelines improved, all patients have not followed the guidelines deteriorated which were 4 patients in our study .This reflects the importance of the strict application of guidelines.

Table 4 shows that chest infection was the most common source of infection in sepsis patients was the chest (44%)

DISCUSSION

This study revealed that the mean age of studied patients was 66.38± 13.34 with a wide range of (28-90). That was matching another study that revealed that the mean age was 63.8 +/- 18.5. [3]

Our study revealed that the percentage of females with sepsis is more than males and this result wasn't matching another study which revealed that the incidence of sepsis is higher in men (54%) than women (46%).[4]

In our study clinical variables were: heart rate (beat/min) mean 106 (65-140) Respiratory rates (breaths/min) mean 21.75±5.66 (12-32). Temperatures (c) mean 38c (35-40). Blood pressures (mm Hg) mean 85 (130-40). which was closely matching another study that revealed Clinical variables, median (IQR) Heart rate (beats / min) 109 (96–122) Respiratory rate (breaths / min) 20 (20–25) Temperature (C) 38.3 (37.4–39.0) Blood pressure, mean arterial, mm Hg (IQR) 87 (78–98) .[5]

Our work revealed that the most common sources of infection were lung 44%, skin 22%, urinary tract 19%, abdomen 6% and unknown source presenting 9%. That wasn't matching another study that revealed that the most common site of infection was urinary tract, Lung, and skin were the most common infected sites (34.3, 14.0, and 13.8%, respectively). [5]

Our study showed that 64% of septic shock patients improved after treatment in the emergency department, that wasn't matching another study that revealed 75.2% improvement in septic shock patients. [6]

Our work showed the outcome of the patients according to their presenting complaints and it was as the following: 87.5% of the patients presented with DLOC deteriorated, 43% of patients with poor oral feeding deteriorated. Another study showed that approximately one-third of patients with sepsis had a Glasgow coma scale less than 12 and that confused and the low conscious level was an independent prognosis factor, increasing mortality rate to 63% when Glasgow coma scale below 8.[7]

Our study shows that 66.6% of septic patients with diabetes deteriorated while another study stated that deterioration was equal in diabetic and nondiabetic patients (31.4% vs. 30.5% respectively). [8]

Our study showed that 58.8% of hypertensive patients with sepsis deteriorated in an emergency department. While other studies revealed that hypertension is protecting against deterioration in septic patients as an increase in the occurrences of sepsis (from 82.7 to 240.4 per 100 000 population), and a decrease in the mortality rate of patients (from 27.8 % to 17.9 %), has been reported in the USA, from 1979 through 2000. The prevalence of hypertension in the same population was >7.0 % to 18.6 % in the same period. [9]

Our study showed that (88%) of the patients received antibiotic within the first three hours. none of them obtained the blood sample for culture. (81%) of the patients received fluid resuscitation therapy within the first three (65.5%) of them received ≥ 30 mL/kg initial fluid challenge within 3 hours of sepsis diagnosis. Another study showing the compliance of SSC guideline application revealed that only 40% (32/80) of patients received antibiotics within one hour of diagnosis. Two sets of blood cultures were obtained before antibiotic administration in 94% (78/83) of patients. (James and Cheryl, 2013). [10]

Nearly all patients (n=81; 97.6%) received at least 1 liter of fluid within 6 hours of sepsis diagnosis. Almost half of the patients (49.4%) received ≥ 30 mL/kg fluid loading within 3 hours of sepsis diagnosis. (James and Cheryl, 2013). [10]

In our study 12 patients improved after management at ER &20 patients deteriorated ,12 of studied patients followed the guidelines improved ,all patients have not followed the guidelines deteriorated which were 4 patients in our study .This reflects the importance of the strict application of guidelines.

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