



Incidence of sepsis in adult patients in intensive care units in Ismailia main hospitals

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Abstract

The Infection is one of the primary causes of human mortality. In the intensive care units a serious complication of infection is sepsis and its complications severe sepsis and septic shock. The incidence of sepsis differs from one place to another place across the world. We aim is to estimate the incidence of sepsis in main hospitals of Ismailia city and to compare this result with results from studies in intensive care units in hospitals in other cities and countries. An observational that has been done in intensive care units of main hospital in Ismailia city. This study showed that cumulative incidence of sepsis to be 5.5% in a period of seven months which is lower than the incidence of severe sepsis in SOAP study and some other studies.

Keywords: Sepsis, incidence, ICU.

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1. Introduction

Sepsis is identified as a syndrome of physiologic, pathologic and biochemical abnormalities which is triggered by infection, and it results in more than \$20 billion (5.2%) of total hospital costs in United States in 2011 (Torio and Andrews, 2013). Sepsis is a common and a life-threatening illness, which is considered as a serious public health problem (Keeley et al, 2017). Sepsis is a fatal disease which is a serious life-threatening illness. A hospitalized sepsis-patient is found to be more likely to die than patients diagnosed with heart attack or stroke (Hall, 2013). The incidence of sepsis varies across the world (Álvaro et al, 2018). In the United States the

incidence of severe sepsis has been found to be around 300 cases per 100,000 population, and those who are treated in the intensive care units (ICUs) are found to be about half of that number (Angus et al,2001). In Sweden the incidence of severe sepsis in 2005 was 430 per 100,000 population (Wilhelms et al, 2010). In 1990 the Center for Disease Control and Prevention conducted the first research about epidemiology of sepsis in the US (Centers for Disease Control (CDC), 1990). After about a decade from that, many studies estimated the incidence of sepsis (Wilhelms et al, 2010), (Martin et al, 2003), (Dombrovskiy et al, 2005), (Melamed et al, 2009).

Angus et al. (Angus *et al*, 2001) estimated incidence of severe sepsis in seven states in United States, then Martin et al. (Martin *et al*, 2003) found an increase in the incidence of severe sepsis from 1979 to 2000. After that Dombrovskiy *et al*. (Dombrovskiy *et al*, 2005), and Melamed *et al*. (Melamed *et al*, 2009) performed similar researches. Other studies which use clinical definitions and ICU observational designs instead of depending on databases have been conducted as well (Vincent *et al*, 2006), (Brun *et al*, 2012), (Finfer *et al*, 2004), (Padkin *et al*, 2003). Our aim is to estimate the incidence of sepsis in main hospitals of Ismailia city and to compare this result with results from studies in intensive care units in hospitals in other cities and countries.

2. Experimental:

This is an observational that has been done in intensive care units of Suez Canal university hospitals which are the main intensive care units in Ismailia city. All adult patient (more than or equal 18 years) admitted in a period of seven months from 1 December 2017 to 30 June 2018 were screened for presence of sepsis.

Diagnosis

Patients were screened for the presence of sepsis according to the criteria of The Third International Consensus Definitions for Sepsis and Septic Shock (Sepsis-3) (Singer *et al*, 2006).

Sepsis clinical criteria

Patients who have a suspected infection and are likely to have a prolonged stay in ICU or to die in the hospital can be identified with qSOFA at the bedside; i.e. 2 or more of:

- Hypotension: Systolic Blood Pressure less than or equal to 100 mmHg
- Altered mental status (Glasgow coma Scale less than 15)
- Tachypnoea: Respiratory Rate greater than or equal to 22
- Organ dysfunction definition is an increase of 2 points or more in the Sequential Organ Failure Assessment (SOFA) score (Singer *et al*, 2006).

Exclusion criteria: Age < 18, Pregnancy, Patients with radiation therapy, Patients with chemotherapy

Safety Considerations: This was an observational study. No intervention has been conducted.

3. Results and Discussion

490 patients were included in the study population who were admitted to intensive care units in Suez Canal university hospitals in the study period and were all adult with on pregnancy or chemotherapy or radiotherapy treatment. 27 patient developed sepsis. Cumulative Incidence of sepsis equals 5.5% in a period of seven months.

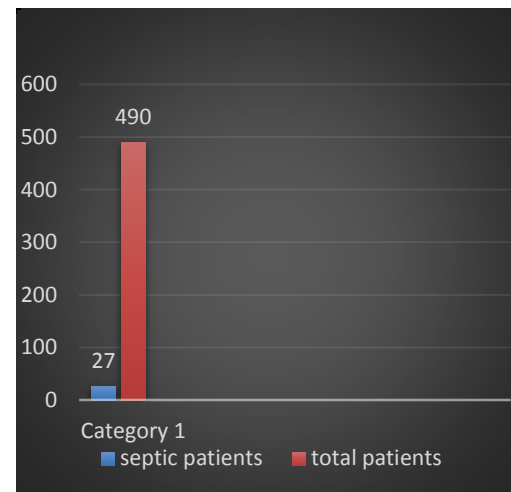


Figure 1: Frequency of sepsis in 7 months

The incidence of sepsis found in this study in Ismailia city is low compared with the measured incidence in other studies which have been made in different countries.

Table 1: Incidence of sepsis in Ismailia city compared with different countries.

Location of study	Incidence
198 European ICUs	30%
French study that included 206 ICUs	14.6%
23 ICUs in Australia and New Zealand	11.8%
ICUs in the United Kingdom	27.1%

We found that cumulative incidence of sepsis to be 5.5% in a period of seven months, while the incidence of severe sepsis in studies in developed world was higher than 5.5%. In the SOAP study which included 198 European ICUs the average was 30% (Vincent *et al*, 2006).

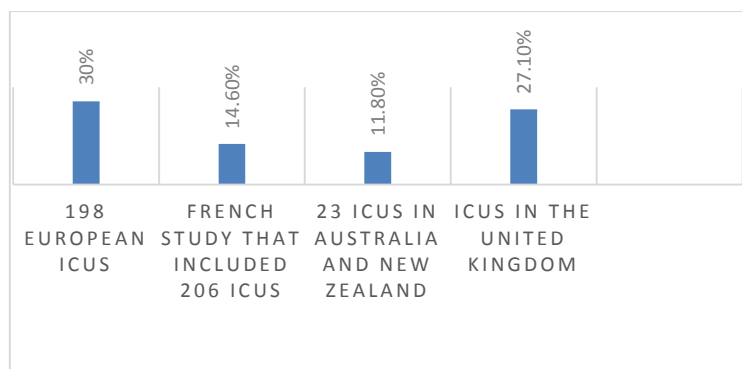


Figure 2: Incidence of severe sepsis in ICUs in different countries (Vincent et al, 2006), (Brun et al, 2004), (Finfer et al, 2004), (Padkin et al, 2003)

In France, a study that included 206 ICUs found that the incidence of severe sepsis is 14.6% (Brun-Buisson *et al.*, 2004). In a study which was conducted in 23 ICUs in Australia and New Zealand, the incidence of severe sepsis was 11.8% (Finfer *et al.*, 2004). And in a study in ICUs in United Kingdom during the first 24 h after ICU admission, the incidence was 27.1% (Padkin *et al.*, 2004). This result reflects the improvement and development in the healthcare system in Egypt and Ismailia in the last years (Talaat *et al.*, 2006). But, recent study found that incidence of sepsis in adult patients in an ICU can be significantly underestimated (Valentine *et al.*, 2019). This recent Australian study which was published in March 2019 suggested adjustments and conditions to avoid underestimating that should be done before assuming that the calculated incidence is truly reflective of the incidence. Our study was also a small study which has been conducted in Ismailia which is a small governorate in Egypt and included small number of patients compared with those studies in the developed countries, so we recommend that future study to be conducted at a larger scale.

4. Conclusion

Cumulative incidence of Sepsis in Suez Canal university hospitals which are the main hospitals in Ismailia is 5.5% which is lower than the incidence of severe sepsis in SOAP study and some other studies conducted in United Kingdom, France, Australia and New Zealand.

5. Conflict of Interest

The authors have no conflict of interest to declare.

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