ISSN 2515-8260 Volume 09, Issue 02, 2022

Assessment of the role of procalcitonin in the management of severe surgical patients with sepsis

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Abstract

Background: The assessment of procalcitonin not only provides valuable information about the diagnosis but is also useful in the selection of the corresponding antibiotics for the management of sepsis. The studies related to this procalcitonin role are comparatively sparse.
Objective: The present study was undertaken to observe the role of procalcitonin in the management of severe surgical patients with sepsis.
Materials and methods: A total of 50 patients diagnosed with sepsis and aged more than 18 years including both males and females were part of the study after obtaining the written, voluntary informed consent. Unwilling participants were excluded from the study. Patients with any severe complications were also excluded from the study.
Results: Results were presented in Tables no 1 and 2. Table no 1 presents the gender distribution of the participants. The majority of the participants were males with 56% and females were 44%. Table no 2 presents the levels of procalcitonin levels in the participants. The majority of the participants have excessive levels of procalcitonin levels. That is procalcitonin was more than 10ng/ml in 40 patients which means nearly 80 percent of the patients have excessive levels of procalcitonin. This will testify to the importance of procalcitonin in the diagnosis of sepsis.
Conclusion: Significantly higher levels of procalcitonin levels were observed in the patients with sepsis. The study results testify to the diagnostic value of the procalcitonin. The study recommends further detailed studies in this area to support the procalcitonin in the diagnosis of sepsis.

Keywords: Sepsis, procalcitonin, infection, inflammation, antibiotic therapy

Introduction

When the body fails to resist the infection, it will lead to sepsis which is a life-threatening condition [1]. In this situation to save the life of the patient, the only way is to diagnose the sepsis at the earliest [2]. However, it is very important to diagnose and separate the infectious and non-infectious types of sepsis. Further, after the diagnosis, it is mandated to select proper antibiotics to manage the sepsis. Because improper treatments lead to adverse effects and

even death of the patient [3]. It was reported that approximately thirty percent of the antibiotics used in the management of clinical cases in hospitals were inappropriate [4]. Hence, from the beginning of diagnosis to the selection of the correct antibiotics, proper care has to be taken. To overcome this problem, blood biomarkers have come into existence [5]. One such effective biomarker is procalcitonin which a precursor of calcitonin [6] is. The assessment of procalcitonin not only provides valuable information about the diagnosis but is also useful in the selection of the corresponding antibiotics for the management of sepsis [7]. The studies related to this procalcitonin role are comparatively sparse. Hence, the present study was undertaken to observe the role of procalcitonin in the management of severe surgical patients with sepsis.

Materials and methods

Study design: Observational study.

Study participants

A total of 50 patients diagnosed with sepsis and aged more than 18 years including both males and females were part of the study after obtaining the written, voluntary informed consent. Unwilling participants were excluded from the study. Patients with any severe complications were also excluded from the study.

Methods

After the recruitment, patients underwent a thorough physical examination. Then the demographic data was obtained followed by detailed data collection. Blood samples were collected by standard procedures mentioned in the literature. The collected blood samples were centrifuged and the supernatant was used to estimate the procalcitonin levels.

Ethical considerations

The study was approved by the institutional human ethical committee. Voluntary informed consent was obtained from all the participants.

Statistical analysis

Data was analyzed using SPSS 20.0. Data was represented in frequency and percentages.

Results

Results were presented in Tables no 1 and 2. Table no 1 presents the gender distribution of the participants. The majority of the participants were males with 56% and females were 44%. Table no 2 presents the levels of procalcitonin levels in the participants. The majority of the participants have excessive levels of procalcitonin levels. That is procalcitonin was more than 10ng/ml in 40 patients which means nearly 80 percent of the patients have excessive levels of procalcitonin. This will testify to the importance of procalcitonin in the diagnosis of sepsis.

Table 1: Distribution of the participants as per the gender

Gender	Number of participants (N=50)
Males	28(56%)
Females	22(4%)

Data were presented as frequency and percentage

Table 2: Distribution of the participants according to the level of calcium

Procalcitonin levels (ng/ml)	Number of participants (N=50)
<0.5	4 (8%)
0.5-1.9	4 (8%)
2-10	2 (4%)
>10	40 (80%)

Data were presented as frequency and percentage

Discussion

The studies related to this procalcitonin role are comparatively sparse. Hence, the present study was undertaken to observe the role of procalcitonin in the management of severe surgical patients with sepsis. The majority of the participants were males with 56% and females were 44%. The majority of the participants have excessive levels of procalcitonin levels. That is procalcitonin was more than 10ng/ml in 40 patients which means nearly 80 percent of the patients have excessive levels of procalcitonin. This will testify to the importance of procalcitonin in the diagnosis of sepsis. In the present situation, the diagnosis of sepsis is still a great task, the procalcitonin is producing promising results. Many earlier studies testified to the role of procalcitonin in the diagnosis of sepsis [8-12]. Further, the studies also explained that there is no harmful effect in assessing the procalcitonin levels [13]. Another study reported that especially in patients who were critically ill, procalcitonin is the only biomarker that guides the treatment strategy [14]. It was reported that procalcitonin-guided treatment significantly decreased the mortality rate in patients with sepsis [15]. The treatment outcomes with procalcitonin-guided treatment were consistent [16-18]. The study results support the results of earlier studies and testify that procalcitonin is a useful diagnostic tool for the early diagnosis of sepsis.

Conclusion

Significantly higher levels of procalcitonin levels were observed in the patients with sepsis. The study results testify to the diagnostic value of the procalcitonin. The study recommends further detailed studies in this area to support the procalcitonin in the diagnosis of sepsis.

Conflicts of interest: None declared.

Source of funding: Self-funding.

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