Original Article

Frequency of Thrombocytopenia in Admitted Patients with Sepsis

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ABSTRACT

Objective: Low platelet level is commonly seen in patients who are admitted with sepsis. It is one of the sequential hematological events that can lead to organ dysfunction and organ failure. The objective of the study was to look into frequency of thrombocytopenia in septic patients and its association with Diabetes, Hypertension and Obesity.

Study Design: Prospective cross-sectional study

Place and Duration of Study: This study was conducted at the Department of medicine, Ayub Teaching Hospital Abbottabad. The study was carried out from 10th February 2021 to 09th January 2022.

Materials and Methods: Total of 94 patients who were admitted into Ayub Teaching Hospital with sepsis were included in the study applying the inclusion and exclusion criteria.

Results: Of these 94 cases, 49 (52.1 %) were male while 45 (47.8 %) were female patients. The mean age was 51.48 ± 10.25 years (with the minimum age of being 32 years while the maximum 76 years). 41 (64.0%) belonged to rural areas and 53 (56.3%) to urban areas. economically, 44 (46.8%) poor, and 50 (53.1%) belonged to the middle-income category. Diabetes was present in 33 (35.1 %) and hypertension 55 (58.5 %). The mean body mass index was 26.11 ± 1.75 kg/m^2 and obesity was present in 20 (21.2 %). The mean platelet count was 153576.23 ± 87752.57 / microliter and thrombocytopenia were noted in 49(52.1%) cases.

Conclusion: Low platelet count was seen in significant number of patients in our study with sepsis. It was also seen in this study that patients with Diabetes Mellitus, Hypertension and obesity were mainly associated with low platelets. It is recommended to correct timely blood glucose and Blood pressure. Similarly avoiding obesity can improve the outcome.

Key Words: Sepsis, Thrombocytopenia, platelet count

INTRODUCTION

Sepsis and its complications are common in admitted patient especially those with comorbid conditions and old age. The incidence of sepsis has increased in the last few decades with longer hospital stay[1].

Bad clinical outcome and death is common in admitted patient with sepsis. The patients without sepsis do well. The sepsis affects the mind and body after the patient who had survived the sepsis.[2] By Definition sepsis is the presence of organ dysfunction and abnormal response to an infection[2].

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The activated platelets secrete different chemicals, as cytokines, chemokines. It leads to inflammation. Endothelial cells and WBCs are the target cells of platelets. Endothelial when the WBCs are activated it produce cell adhesion and tissue factor, Von Willebrand factor, cytokines, proteases and nitric oxide[3]. Decreased production of platelets is due suppression of the bone marrow by toxins, medicines, or inflammatory mediators.[3]

In patients with sepsis the low platelet count is evident by complete blood picture and blood peripheral smear.[4] The low platelet count responds to treatment of the underlying cause.[5] Different studies show different underlying etiologies of low platelets in patients with sepsis. A study done patients with sepsis in USA, the most of the patients (93.7%) had septic shock, with underlying cause as pneumonia (38.8%) and Thrombocytopenia developed in 47.6% patients with sepsis[6]. In Pakistan one study showed 59.9% patients with sepsis were with low platelet count study performed in Pakistan showed a high percentage of thrombocytopenia in patients with sepsis which was 59.9% and more deaths in septic patients with low platelets count as compared to normal platelet count.[7,8].

MATERIALS AND METHODS

This study was done in the department of Medicine, Ayub Teaching Hospital from 10th February 2021 to 09th January 2022. The patients with sepsis and ages 16 to 85 years of both genders were included in the study. The exclusion criteria were patient with anemia, leukemia, ITP, TTP, and HUS. A total of 94 patients were included in the study as per inclusion criteria.

After getting approval from hospital ethic committee, data was collected on prescribed proforma. Data was collected from the patients only after consent. Relevant history and examination were completed as per requirement. A 3 ml blood in CP bottle was collected from the patient. The blood was tested for platelet count in main lab of the hospital under the supervision of pathologist. To control confounding factors the exclusion criteria was followed.

SPSS 21.0 was used for analysis of data. Age and platelet count were described as mean $\pm$ standard deviation. The significances level kept less than 0.005.

RESULTS

Of 94 study cases, 49 (52.1 %) were male while 45 (47.8 %) were female patients. The mean age was 51.48 $\pm$ 10.25 years (with the minimum age of being 32 years while the maximum 76 years). The mean age of the male patients was 53.16 $\pm$ 7.89 years and female patients were 60.12 $\pm$ 12.75 years (p=0.029).

Forty-one (64.0%) belonged to rural areas and 53 (56.3%) to urban areas. Economically, 44 (46.8%) poor, and 50 (53.1%) belonged to the middle-income category. Diabetes was present in 33 (35.1 %) and hypertension 55 (58.5 %). The mean body mass index was 26.11 $\pm$ 1.75 kg/m^2 and obesity was present in 20 (21.2 %). The mean platelet count was 153576.23 $\pm$ 87752.57 / microliter and thrombocytopenia were noted in 49(52.1%) cases. The different variables are depicted in the tables.

Table No. 1: Thrombocytopenia with regard to gender (n = 94)

Gender	Thrombocytopenia		P–value
	Yes (n=49)	**No** (n=45)	
Male (n=49)	33	16	**0.072**
Female (n=45)	21	24	

Table No. 2: Thrombocytopenia and age (n = 94).

Age	Thrombocytopenia		P – value
	Yes (n=49)	**No** (n=45)	
Up to 50 Years (n=39)	19	20	**0.596**
More than 50 Years (n=55)	30	20	
Total	**94**		

Out of 49 patients who were in sepsis with low platelets 23 died, with overall mortality was 46.9% and among the patient without low platelets mortality was 10(22.2%).

DISCUSSION

Low platelet count (platelet count < 150,000/μl) is common in seriously ill patients. It is in 20%–40% in admitted patient with sepsis[9]. It is a risk factor for mortality[10]. The low platelet count and decreasing platelet count in admitted patient is a poor prognostic factor [11]. Similarly, if the platelet count remains low for longer time and there is no rise then again it is with bad prognosis. Many studies are done to find out the risk factors for thrombocytopenia.[12,13,14]. Sepsis was common risk factor in development of thrombocytopenia. Beside sepsis there are other causes which act as risk factors for development of low platelets in admitted patients. They are increased severity of illness, some antibiotics like vancomycin, beta lactum and Heparin; however, these findings are not supported as not consistent in different studies[15].

The low platelet count is studied in many studies as its incidence and association with risk factors. With clinical outcomes[16,17]. The data is limited about thrombocytopenia and sepsis. Severity of illness and sepsis play is major determining factor in low platelet count[18,19]. It is shown in our study that males are more affected than female. This finding is consistent with other studies, the occurrence of male gender in one study was 56.2% while in others it was 74% and 51%. The mean age was 51.48 $\pm$ 10.25 years (with the minimum age of being 32 years while the maximum 76 years) it is shown by Venkata et al as 68.8 $\pm$ 15.8 years mean.

Out of 94 patients 41 (64.0%) were from rural areas and 53 (56.3%) urban areas. economically, 44 (46.8%) poor, and 50 (53.1%) belonged to the middle-income category. So here significant numbers were poor.

Diabetes was present in 33 (35.1 %) and hypertension in 55 (58.5 %) patients. Venkata et al has reported 36 % diabetes and 75% hypertension. Similar result was shown by Burunsuzoğlu et al[8] as 25. 4 % diabetes and 37. 3 % hypertension. These studies have shown that the patients with co morbid conditions like old age, hypertension, obesity and diabetes are more prone to develop low platelet count when they got sepsis. It can lead to more complications as compared to those without co morbid conditions.

The average BMI was 26.11 $\pm$ 1.75 kg/m^2 and twenty patients were found obese (21.2 %). It is comparable with other studies done.

The mean platelet count was 153576.23 $\pm$ 87752.57 / microliter and low platelet count was noted in 49 (52.1%) cases. It is comparable with other studies done like 47.6 % by Venkata et al and 57.1% by Burunsuzoglu et al.[8]

The death rate of patients with sepsis was higher with low platelets than without thrombocytopenia. It is consistent with other studies done. Thus, it shows the importance of early recognition of low platelet count and subsequent prompt measures to decrease the mortality[20].

CONCLUSION

It was clear in this study that sepsis patients were with low platelet count. Thrombocytopenia was common in patients who were obese and poorly controlled blood pressure and glucose.it is therefore recommended that patients with diabetes, hypertension and increase body weight sepsis should be treated promptly to avoid all its complications.

Author's Contribution:

Concept & Design of Study:	Haidar Zaman
Drafting:	Mohsin Khan, Abdul Rauf
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Revisiting Critically:	Haidar Zaman, Mohsin Khan
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Conflict of Interest: The study has no conflict of interest to declare by any author.

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