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ORIGINAL ARTICLE

Aplastic Anemia in Patients with New-Onset Pancytopenia

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ABSTRACT

Objective: To determine the frequency of aplastic anemia in patients with new-onset pancytopenia
Study Design: This was discripative cross-sectional study
Place and Duration of Study: Our current research was conducted at Shaikh Zayed Hospital, Lahore from June 2021 to November 2021
Methods: The study comprised 220 patients who had peripheral blood smears and showed new onset pancytopenia. Participants had to sign an informed consent form, be at least 14 years old, and be of either sex to be eligible. Patients were interviewed and physically examined for 20 to 30 minutes as part of the study, which included access to electronic health record data.
Results: There were 122 (55.5%) male and 98 (44.5%) female patients in the study group. 107 (48.6%) patients belonged to middle class, 78 (35.5%) belonged to lower class while 35 (15.9%) patients belonged to high class. Aplastic anemia was diagnosed in 73 (33.2%) patients.
Conclusion: The frequency of aplastic anemia was found to be 33.2% in children presenting with new-onset pancytopenia. There was no significant difference in the frequency of aplastic anemia across age, gender and socioeconomic status.
Keywords: Aplastic Anemia; Pancytopenia; Hematemesis; Anemia

INTRODUCTION

When all three types of peripheral blood cells — erythrocytes, platelets and leukocytes are depleted, it causes anaemia, leukopenia, and thrombocytopenia — a hematologic disorder known as pancytopenia.[1,2] The following are the first and second steps. If you see it in everyday clinical practise, you're not out of the woods yet. Depending on which cell line or lines are damaged, the signs and symptoms of pancytopenia might vary widely. Malaise, exhaustion, bruises, and nosebleeds are among the most common symptoms.[3] Hemodynamic instability, bleeding, febrile neutropenia and hypoxia as well as sepsis, are all life-threatening consequences. Pancytopenia has a wide range of causes and etiologies, which can be divided into three groups: (1) reduced output, (2) collateral damage, and (3) diminished output and collateral damage. [4,5]

Some non-malignant and malignant illnesses can lead to Pancytopenia, which can be seen as a clinical symptom. Pancytopenia can be caused by a number of different ways. Aplastic anaemia, haematological malignancies, inefficient hematopoiesis with cell death, megaloblastic anaemia, antibody-mediated cell destruction, and hypersplenism are all examples of a decline in hematopoietic cell production that must be taken into consideration.[6] Patients with pancytopenia are treated and given a prognosis based on the underlying disorder's aetiology and severity. The vast majority of pancytopenia cases can be cured with early diagnosis and specialised treatment. Early diagnosis and treatment can also improve quality of life by lowering death and morbidity rates.[7]

A wide range of variables, including differences in nutrition, gender, age, geographic location, standard of living, exposure to cytotoxic medications or toxins, infectious exposure, and genetic and mutation profile, influence the aetiology of pancytopenia in different populations.[8] From country to country, and even within the same country, the aetiology of pancytopenia varies. In northern and southern India, megaloblastic anaemia was shown to be the most common cause of pancytopenia, while in western India, hypersplenism and infections were found to be the most common underlying diseases. [9] Following megaloblastic anaemia, aplastic anaemia was shown to be the primary cause of pancytopenia in eastern India. Hypoplastic anaemia was shown to be the most common cause of pancytopenia in a study in Nepal.[9] According to a Pakistani study, the most common cause of pancytopenia is megaloblastic anaemia, followed by aplastic anaemia.[10]

MATERIAL AND METHODS

This was a descriptive cross-sectional study, Our current research was conducted at Shaikh Zayed Hospital, Lahore from June 2021 to November 2021. The sample size was calculated of 220 patients using WHO software using with a confidence level of 95% and a margin of error of 5%. Consistent sampling methods were employed (non-probability).

The study included all hospitalised patients with new onset pancytopenia on peripheral blood smear, aged 2 months to 15 years, regardless of gender. Patients who were not admitted, did not want to undergo a bone marrow examination (BME), and were less than 2 months or older than 15 years were eliminated. Bone marrow examinations were performed on all individuals who met the inclusion criteria for the study. A trephine biopsy was also included in BME.

The SPSS version 13 computer programme was used to examine the data. For numerical factors such as age, the mean standard deviation was determined. For example, aplastic anaemia and gender were used as categorical variables to calculate frequency and percentages. Tables were used to show the effect modifiers in the results, which were stratified by age and gender.

RESULTS

Aged 1 to 15, the patients had a mean of 6.743.69 years, with a standard deviation of 3.69 years. A total of 122 men and 98 women were included in the study group. 107 (48.6%) patients belonged to middle class, 78 (35.5%) belonged to lower class while 35 (15.9%) patients belonged to high class as shown in Table 1. Aplastic anemia was diagnosed in 73 (33.2%) patients as shown in Table 2. Anemia frequency was not substantially different by age (p=0.998), gender (p=0.890), or socioeconomic position as indicated in Table 3, which summarises the findings.

Table 1: Baseline Characteristics of Study Sample

Characteristics	Variables	Study Sample
Age (years)	Mean±SD	6.74±3.69
Age Groups	1-5 years	83 (42.3%)
	6-10 years	88 (40.0%)
	11-15 years	39 (17.7%)
Gender	Male	122 (55.5%)
	Female	98 (44.5%)
Socioeconomic Status	Lower Class	78 (35.5%)
	Middle Class	107 (48.6%)
	High Class	35 (15.9%)

Table 2: Frequency of Aplastic Anemia

Aplastic Anemia	Frequency (n)	Percent (%)
Yes	73	33.2%
No	147	66.8%
Total	220	100%

Table 3: Frequency of Aplastic Anemia across age groups, gender and socioeconomic class

parameters	Variaables	Aplastic Anemia	p-value
Age Groups	1-5 years	31 (33.3%)	0.998
	6-10 years	29(33.0%)	
	11-15 years	13(33.3%)	
Gender	Male	40(32.8%)	0.890
	Female	33(33.7%)	
Socioeconomic Status	Lower class	27(34.6%)	0.936
	Middle class	35(32.7%)	
	High Class	11(31.4%)	

DISCUSSION

In clinical practise, pancytopenia is a common hematologic condition. Pancytopenia was found in 9.3% of patients admitted to the internal medicine department in this study, but the frequency of this condition has been found to be fairly diverse in other investigations, the majority of which focused on paediatric patients. In 2015, a research at Kuwait Teaching Hospital, Peshawar, found that 57% of adults in the adult medicine department were diagnosed with the disease.[11] The frequency of pancytopenia among the adult and paediatric population in Rawalpindi, Pakistan, was found to be 21.2 percent, according to another study.[12] Pancytopenia was found to be 2.52 percent and 3.57 percent common in children studied by Umbreen et al.[13] and Shazia et al.[12]. Pakistani adults are more likely to suffer from pancytopenia, according to these studies.

The average age of the patients in this study was 6.74 3.69 years. In all, n=93 patients (42.3%) ranged in age from 1 to 5 years, with 88 (40.0 percent) being 6 to 10 years old, and 39 (17.7 percent) being 11 to 15 years old. Among the children who presented with pancytopenia at Children Hospital and The Institute of Child Health, Lahore in 2012, Khan et al.[14] found that 42 percent of them were aged 1 to 5 years, 40 percent were aged 6 to 10 years, and 18 percent were aged 11 to 15 years. The study had a male to female ratio of 1.2:1, with 122 patients (55.5 percent) and 98 (44.5 percent) participating. In 2004, Ishtiaq et al.[15] reported a male to female ratio of 1.2:1 after seeing comparable male predominance among patients at Holy Family Hospital, Rawalpindi.

Aplastic anaemia was found in 73 of the patients, or 33.2% of the total. Age (p=0.998), gender (p=0.890), and socioeconomic position were not statistically significant factors in the prevalence of aplastic anaemia (p=0.936). Jalbani et al.[16] observed similar rates of aplastic anaemia in pancytopenic patients in 2009 (32.50 percent), as did Jjan et al.[17] in 2010 (33.30 percent), Asif et al.[18] in 2010 (31.90 percent), as did Dasgupta et al.19 in 2015 (33.5 percent) for the local population and Indian studies.

Thus, the prevalence of aplastic anaemia in children with new-onset pancytopenia was found to be 33.2 percent, regardless of the patient's age, gender, or socioeconomic background. According to the findings of this study, a significant number of children with new-onset pancytopenia suffer from aplastic anaemia. In order to better serve patients in the future, it is imperative that this condition be considered a differential diagnosis and thoroughly examined prior to treatment.

The lack of evaluation of the contributing factors to aplastic anaemia in such youngsters was a significant drawback of the present investigation. To identify high risk children, it is helpful to know the frequency of common contributing factors. In the future, such a study should be highly suggested.

CONCLUSION

The frequency of aplastic anemia was found to be 33.2% in children presenting with new-onset pancytopenia. There was no significant difference in the frequency of aplastic anemia across age, gender and socioeconomic status.

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