

# FREQUENCY OF APLASTIC ANAEMIA IN CHILDREN

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## ABSTRACT

**Background:** Aplastic anaemia is a rare haematopoietic stem cell disorder. The aetiology of the acquired aplastic anaemia is most of the times unknown. The blood count reveals decrease in either or all the cell lines and bone marrow is hypocellular. Objective of this study was to find out the prevalence of aplastic anaemia in anaemic children.

**Material & Methods:** This was a descriptive study of 40 children with anaemia in the Paediatric Unit of District Headquarter Teaching Hospital D.I.Khan from January 2007 to December 2008. Both male and female children up to 12 years age were included in the study. Clinical record, full blood count, peripheral smear and bone marrow reports were recorded.

**Results:** Among 40 patients, 19(47.5%) were males and 21(52.5%) females, with male to female ratio of 1:1.1. Age range was 0-12 years, with less than 1 year 3(7.5%), 1-5 years 24(60%) and 5-12 years 13(32.5%) patients. Blood count/and peripheral smear analysis revealed anaemia in 40(100%), thrombocytopenia 36(90%) and leukopenia in 17(42.5%) patients. Pancytopenia was present in 17(42.5%) and bicytopenia in 18(45%). Together bicytopenia and pancytopenia constituted 87.5%. Bone marrow findings showed hypoplasia/aplasia in 8(20%), leukaemia 6(15%) and megaloblastic anemia in 23(57.5%).

**Conclusion:** The prevalence of aplastic anemia is 20% among anaemic children in our set up.

**KEY WORDS:** Anaemia, Aplastic anaemia, Pancytopenia.

## INTRODUCTION

Aplastic anaemia is a rare haematopoietic stem cell disorder. It may be congenital or acquired. Most of the cases of aplastic anaemia are acquired however there are unusual inherited forms as well. Aplastic anaemia is the main syndrome of bone marrow failure. Bone marrow failure includes conditions in which there is primary failure at the haematopoietic precursor level. The term 'bone marrow failure' usually excludes the conditions associated with marrow infiltration like leukaemia.<sup>1</sup>

There may be minor dyserythropoietic changes variably present in the bone marrow aspirates of the normal individuals,<sup>2</sup> but the bone marrow of the patients with aplastic anaemia shows hypocellularity. The blood count of these patients reveals pancytopenia. Aplastic anaemia is labeled as severe when neutrophil count is less than 500, platelet count is less than 20,000, retic count is less than 1% and bone marrow cellularity is less than 20%.<sup>3</sup> The aetiology of the acquired aplastic anaemia is most of the times unknown. It is thought that the environmental exposures like drugs, viruses, toxins and radiations trigger the aberrant immune response in some patients, but most of the cases are still classified as idiopathic. Drugs implicated specially for their idiosyncratic reaction are chloromphenicol, oxyphenbutazone and quinacrine, etc. Toxins include exposure to ben-

zene, insecticide and heavy metals. Among the infectious causes, notable are viral hepatitis and infectious mononucleosis. In immunocompromised children, aplastic anemia may be caused by human parvovirus and chronic infection. Human parvovirus B19 may be associated with transient erythroblastopenia of childhood.<sup>4</sup> However the pathophysiology involves immune mediated processes in most cases. Autoreactive lymphocytes mediate the destruction of haemopoietic stem cells. The main evidence that the immune reactions are implicated in the pathophysiology of aplastic anaemia is the observation that immunosuppressive therapy produces remission. In addition proportion of activated CD 8+ cells is increased and there is increased level of inhibitory cytokines like Gamma interferon and tumor necrosis factor in the bone marrow.<sup>5</sup>

Aplastic anaemia has a varied clinical course. Some patients have life threatening pancytopenia presenting as medical emergency and necessitating vigorous therapy. On the other hand some have milder symptoms that necessitate little or no therapy. The child may present with weakness, pallor, petechiae, purpura, bleeding and frequent or severe infections. Paroxysmal nocturnal haemoglobinuria and myelodysplastic syndrome arise commonly in patients with aplastic anaemia. These disorders have some pathophysiological link with the disorder.<sup>6</sup>

Treatment of aplastic anaemia involves allogenic bone marrow transplantation,<sup>7</sup> immunosuppression<sup>8</sup> with antithymocyte globulin, cyclosporine and high dose cyclophosphamide.<sup>9,10</sup>

Keeping these in mind the present study was designed to find out the prevalence of aplastic anaemia in pediatric population of Dera Ismail Khan region.

**MATERIAL AND METHODS**

This cross-sectional descriptive study was carried out in Paediatric Unit of District Headquarter Teaching Hospital, D.I.Khan from January 2007 to December 2008.

Forty children with anaemia, both males and females 0-12 years of age were included in the study. Clinical record, full blood count, peripheral smear and bone marrow reports of these patients were recorded and analysed.

**RESULTS**

Among 40 children studied, 19 (47.5%) were males and 21 (52.5%) females with a male to female ratio of 1: 1.1. Age range was 0-12 years. Age and gender distribution of patients is given in Table 1. Children having age range of 1-5 years were maximum in number i.e. 24 (60%).

Blood count and peripheral smear findings revealed anaemia in 40 (100%), thrombocytopenia in 36 (90%) and leukopenia in 17 (42.5%). Pancytopenia was present in 17 (42.5%) and bicytopenia in 18 (45%). Together bicytopenia and pancytopenia constituted 87.5%. (Table 2)

**CONCLUSION**

The frequency of aplastic anemia is 20% among anaemic children in our set up. The majority of these cases are of idiopathic aetiology.

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**Table 1: Age and sex distribution of patients with aplastic anaemia.**

Age Group	< 1 year	1-5 years	5-12 years	Total
Male	2 (5%)	10 (25%)	7 (17.5%)	19 (47.5%)
Female	1 (2.5%)	14 (35%)	6 (15%)	21 (52.5%)
Total	3 (7.5%)	24 (60%)	13(37.5%)	40 (100%)

**Table 2: Blood count findings of study patients.**

	Number of cases	Percentage
Anaemia	40	100
Thrombocytopena	36	90
Leukopenia	17	42.5
Pancytopenia	17	42.5

**Table 3: Bone marrow findings of study patients.**

	Number of cases	Percentage
Aplastic anaemia	8	20
Leukaemia	6	15
Megaloblastic Anaemia	23	57.5
Infection related	3	7.5

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