

PREVALENCE OF MEGALOBLASTIC ANAEMIA IN A PAEDIATRIC UNIT

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ABSTRACT

Background: Megaloblastic anaemia is common in paediatric population of developing countries. The objective of this study was to find out the prevalence of megaloblastic anaemia in Paediatric Unit of District Headquarter Teaching Hospital, Dera Ismail Khan.

Material & Methods: A retrospective analysis of forty bone marrow aspirates was performed to find out the prevalence of megaloblastic anaemia in Paediatric unit of District Headquarter Teaching Hospital Dera Ismail Khan, from January 2007 to December 2008. Both male and female indoor patients up to 12 years of age were included in the study.

Results: Blood count and peripheral smear findings revealed anaemia in 40(100%), leukopenia in 17 (42.5%) and thrombocytopenia in 36 (90%) patients. Bicytopenia was present in 18 (45%) and pancytopenia in 17 (42.5%) patients. Analysis of the bone marrow findings showed megaloblastic anaemia in 23 (57.5%), bone marrow hypoplasia /aplasia in 8(20%) and Leukaemia in 6 (15%) patients. So megaloblastic anaemia was the most prevalent finding in this study. Next was bone marrow hypoplasia /aplasia, followed by leukaemia.

Conclusion: Megaloblastic anaemia is the most prevalent diagnosis and the major cause of bicytopenia and pancytopenia in the bone marrow aspirates performed in the Paediatric unit of District Headquarter Teaching Hospital District Dera Ismail Khan.

Key words: Anaemia, Megaloblastic anaemia, Bicytopenia, Pancytopenia.

INTRODUCTION

Megaloblastic anaemia is fairly common in paediatric population of the underdeveloped countries. It is a macrocytic anaemia caused by the deficiency of folic acid, vitamin B₁₂, or both. Megaloblastic anaemia resulting from malnutrition is relatively uncommon in the developed countries but important worldwide.¹

Folic Acid deficiency is caused by inadequate intake, malabsorption, increased folate requirements or a combination of these. Folate deficiency is one of the important component of Kwashiorkor, marasmus or sprue. Folate deficiency is common in malnourished children fed on goat's milk. Similarly children with increased body requirements like rapid growth in infancy especially low birth weight and pre-mature babies having rapid catch-up growth and children with hemolytic anaemias are particularly susceptible to develop folate deficiency. Besides megaloblastic anaemia, folate deficiency is also inflicted in neural tube defects in newborns.²

Vitamin B₁₂ deficiency is caused also by dietary deficiency in children with malnutrition, as well as children fed by mothers having B12 deficiency. Intestinal malabsorption, pernicious anemia, crohn's disease, chronic pancreatitis, bacterial overgrowth of the small intestine, tape worm infestation, and surgical resection of terminal ileum are the other causes of vitamin B₁₂ deficiency.³

Clinical presentation of children with megaloblastic anaemia is pallor and sometimes mild jaundice due to ineffective erythropoiesis. Characteristically the tongue is beefy red and smooth. Children with vitamin B₁₂ deficiency present with irritability and poor appetite besides anaemia. Older children may present with paraesthesiae, weakness, gait abnormalities, and on neurological examination may reveal decreased sense of vibration and proprioception.⁴

Diagnosis of megaloblastic anaemia requires complete blood count, peripheral smear and bone marrow aspiration.

Peripheral smear shows macrocytosis. Red blood cells are larger than normal at every stage and have an open, finely dispersed nuclear material and asynchrony between maturation of nucleus and cytoplasm. Cytopenias e.g. bicytopenia and pancytopenia are common findings in megaloblastic anaemia of the childhood.⁵ There is delay in nuclear progression which becomes evident with further cell maturation. Giant metamyelocytes and bands are also present in the marrow. Ineffective erythropoiesis and premature death of cells decreases the output of cells from the bone marrow, and so anaemia occurs.

The objective of this study was to find out the prevalence of megaloblastic anaemia in Paediatric unit of District Headquarter Teaching Hospital, Dera Ismail Khan.

MATERIAL AND METHODS

A retrospective analysis of 40 children with bone marrow aspiration was done in the Paediatric unit of the District Headquarter Teaching Hospital, Dera Ismail Khan from Jan 2007 to Dec 2008. Both males and females up to 12 years were included in the study. All the children belonged to Dera Ismail Khan and the surrounding areas. Full blood count, peripheral smear and bone marrow examination were per-

formed besides clinical history and physical examination.

RESULTS

Among 40 children, 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 group less than 1 year were 3 (7.5%), 1-5 years 24 (60%) and 5-12 years 13 (32.5%). Children having age range of 1-5 years were maximum in number i.e. 24 (60%). (Table-1)

Blood count and peripheral smear findings revealed anaemia in 40 (100%), leukopenia in 17 (42.5%) and thrombocytopenia in 36 (90%). Anaemia was present in all the children while thrombocytopenia was the next common finding (90%) and leucopenia was the least common finding (42.5%). Bicytopenia was present in 18 (45%) and pancytopenia in 17 (42.5%). Together bicytopenia and pancytopenia constituted to 35 (87.5 %). (Table-2)

Analysis of bone marrow showed megaloblastic anaemia to be present in 23 (57.5%), bone marrow hypoplasia /aplasia in 8 (20%) and leukaemia in 6 (15%). So megaloblastic anaemia was the most common finding in this study. Next was bone marrow hypoplasia /aplasia, followed by leukaemia.

Table-1: Age and sex distribution of patients in the study.

Age Groups	Male	Female	Total
<1 year	2 (5%)	1 (2.5%)	3 (7.5%)
1-5 years	10 (25%)	14 (35%)	24 (60%)
5-12 years	7 (17.5%)	6 (15%)	13 (32.5%)
Total	19 (47.5%)	21 (52.5%)	40 (100%)

Table-2: Blood count and peripheral smear findings.

	Anaemia	Leukopenia	Thrombocytopenia	Bicytopenia	Pancytopenia
Number of cases	40	17	36	18	17
Percentage	100%	42.5%	90 %	45%	42.5%

Table-3: Bone marrow findings.

	Megaloblastic Anemia	Hyoplasia /Aplasia	Leukaemia	Miscellaneous
Number of cases	23	8	6	3
Percentage	57.5 %	20 %	15 %	7.5 %

DISCUSSION

In our study among 40 anaemic children who underwent bone marrow aspiration, the most common finding was megaloblastic anaemia in 57.5%. Most of these patients had either bicytopenia 45% or pancytopenia 42.5%. Together these patients constitute 87.5%. These findings in our study are consistent with the findings of a study performed at Abbasi Shaheed Hospital Karachi showing megaloblastic anaemia to be the most prevalent finding and the most common cause of pancytopenia.⁶ Similarly series of comparable studies by Savage et al,⁷ Iqbal et al⁸ and Qazi et al,⁹ all showed that megaloblastic anaemia was the major cause of pancytopenia.

The most common age group involved in our study was 1-5 years who were 60%. These figures give a clue that 1-5 years is the most vulnerable age for the development of nutritional anaemia. Hence it points to the important fact that malnutrition is one of the major problems in the paediatric population in an underdeveloped area like Dera Ismail Khan.

Besides malnutrition, lack of clean water supply also leads to increased incidence of diarrhea and parasitic infestations in the low socio-economic conditions. Naeem and Uttra showed in one of the studies conducted in adults at Northern areas of Pakistan that giardiasis was the common cause of megaloblastic anaemia in Gilgit and surrounding areas.¹⁰ Treatment of water like filtration and chlorination reduces the incidence of giardiasis and hence megaloblastic anemia.¹¹ The mechanism that how giardiasis causes megaloblastic anaemia is directly related to the malabsorption which in turns leads to decreased absorption of folate and vitamin B₁₂ and so megaloblastic anaemia occurs.¹² Another mechanism which seems to contribute is the mucosal damage caused by giardiasis leading to impaired absorption of vitamin B₁₂ and folic acid.¹³

CONCLUSION

Megaloblastic anaemia is the most prevalent diagnosis and the major cause of bicytopenia and pancytopenia in the bone marrow aspirates performed in the Paediatric unit of District Headquarter Teaching Hospital District Dera Ismail Khan.

All children having bicytopenia and pancytopenia should be investigated for megaloblastic anaemia.

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