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CLINICO-HEMATOLOGICAL PROFILE OF CHILDREN WITH MEGALOBLASTIC ANEMIA.

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ABSTRACT

Background: Megaloblastic Anemia is an important reversible cause of neurodevelopmental deterioration. The main objective of study was to describe the varied clinical and hematologic manifestations of Megaloblastic Anemia in children admitted to a tertiary care hospital. **Methods:** A Retrospective cross - sectional study was conducted in children between 6 months and 15 years, who were admitted with diagnosis of megaloblastic anemia from year 2012 to 2015. Case records of eligible participants were analysed for primary outcome measures like presenting clinical features, mode of diagnosis, peripheral smear findings and secondary outcome measures like age, sex, coexisting morbidities. **Results:** Of a total of 150 cases, in 64 % subjects, diagnosis was confirmed by Vitamin B12 assay, 36% were diagnosed by bone marrow examination. Macrocytic anemia was observed in peripheral smear examination in 100% subjects. Hyperpigmentation was noticed in 57% of subjects. Blood transfusion secondary to severe anemia was needed in 38% of subjects. Pallor was observed in 100% subjects, neurologic manifestations in 28% subjects. **Conclusion:** The most common presenting complaint in megaloblastic anemia due to Vitamin B12 deficiency is anorexia, generalised weakness, irritability manifesting clinically as pallor, hyperpigmentation and haematologically as macrocytic anemia. Regular report of common presentations of megaloblastic anemia in various age groups keeps the child care expert vigilant for its early detection.

KEYWORDS: Macrocytic anemia, Vitamin B_{12} deficiency, Pallor.

INTRODUCTION

Megaloblastic Anemia is classically defined as a macrocytic anemia that is characterized by a specific megaloblastic bone marrow morphology showing megaloblasts, accompanied by leukopenia and thrombocytopenia.[1] Nutritional deficiency had been the main culprit for widespread disease manifestations in a large population, especially among low income groups.[2] The spectrum of disease associated with vitamin B12 deficiency is wide, from asymptomatic to life-threatening pancytopenia or myelopathy. The recognition and treatment of vitamin B12 deficiency is critical since it is a reversible cause of bone marrow failure and demyelinating nervous system disease.[3]

This study intended to observe the clinical and hematologic profile of megaloblastic anemia in a tertiary health care centre, and common modes of presentation and distribution among various age groups.

MATERIAL AND METHODS

This was a retrospective observational study, where all children aged between 6 months and 15 years, admitted with a diagnosis of Megaloblastic Anemia from year 2012 to 2015 were included. The case records were accessed through admission and discharge database of the institute. The case records of all enrolled children were examined and primary outcome measures like presenting complaints, mode of diagnosis, peripheral smear findings, and clinical features were noted. The secondary outcome measures noted were age, sex, coexisting morbidities and nutritional status. The mode of diagnosis considered was either Vitamin B12 assay or bone marrow examination. Vitamin B12 was estimated by enzyme immunoassay and a value of <187 pg/ml was considered low value. Bone marrow examination was performed by using Jamshidi bone marrow biopsy needle, and the aspirate was examined for metamyelocytes, megaloblasts, and reported by the pathologist.[4] All the case records were analysed and tabulated clinical features and common modes of presentation in various age groups. Multivariate regression analysis was performed to identify the association of aforementioned outcome measures with the disease.

RESULTS

A total of 150 cases were included in study, in 64 % subjects, diagnosis was confirmed by Vitamin B12 assay, 36% were diagnosed by bone marrow examination. 58% were females, 42% were males. Age wise distribution listed in **(Table 1).**

Anorexia, generalised weakness, pallor was observed in 100% subjects, hyperpigmentation in 57% subjects, neurologic manifestations like irritability, tremors/seizures in 28% subjects **(Table 2).** Macrocytic anemia and bicytopenia was observed in peripheral smear examination in 100% and 68% subjects respectively. The median haemoglobin was 7.6 g/dL with severe anemia noted to be in 38% subjects who needed blood transfusion **(Table 3).** All the measured outcomes correlated with the disease outcome with a p value <0.005.

Table 1: Age wise distribution of cases

Age	Percentage(%)
Infants (>6 months, upto 1 year)	35
1-5 years	22
6-10 years	09
11-15 years	34

Table 2: Clinical profile of Cases.

Clinical feature	Percentage(%)
Pallor	100
Anorexia / generalized weakness	100
Hyperpigmentation	57
CNS symptoms	28

Table 3: Hematologic profile of Cases

Haematological profile	Percentage(%)
Macrocytic anemia (MCV>100 µg/L)	100
Bicytopenia	68
Need of blood transfusion.	38
Diagnosis by bone marrow	64
Diagnosis by Vitamin B12 assay	36

DISCUSSION

The present study revealed the most common presenting complaint in megaloblastic anemia due to Vitamin B12 assay to be generalized weakness and/or anorexia, irritability with the most common clinical finding of pallor, hyperpigmentation which is comparable to study by Zengin et al.[5]

Incecik F et al reported incidence of neurologic manifestations (irritability, tremors /seizures) to be 33% in their study which is comparable to present study[6]. 38% of the cases needed blood transfusion secondary to severe anemia in a study conducted by Gomber et al, whose percentage is lesser in the present study.[7] Hyperpigmentation results from decreased glutathione which induces tyrosinase activity, which in turn mobilizes melanocytes to keratinocytes, causing increased melanin synthesis.[8]

Bicytopenia, was noted in the same study as well as in Meghann et al, study to be 44.8%, which is far less compared to present study (68%).[9] The increased incidence in two extreme age groups can be attributed to improper weaning practices and continued exclusive breastfeeding in infants group. Megaloblastic anemia was predominantly diagnosed by bone marrow and Vitamin B12 assay, where emphasis has to be laid on Vitamin assay in order to standardise the diagnostic options among various hospital settings. It also adds the advantage of less expertise, easy to perform process.

The merits of study being the description of varied clinical features and modes of presentation of Megaloblastic Anemia, along with the distribution among various age groups. The drawbacks of our study are that we couldn't draw a causal relationship between nutritional deficiency and megaloblastic anemia.

CONCLUSION

This study described the varied presentations of the disease in children, and degree of disease among various age groups. Regular report of common presentations of megaloblastic anemia in various age groups keeps the child care expert vigilant for its early detection.

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