

**SEVERE MEGALOBLASTIC ANEMIA WITH MODERATE ACUTE MALNUTRITION  
IN AN INFANT: A RARE CASE REPORT****Kodandaraman Thoti<sup>1\*</sup>, Madhavi V. T.<sup>1</sup>, Sravya Sruthi P.<sup>2</sup> and Lakshmi P.<sup>3</sup>**<sup>1</sup>Pharm D Intern, Department of Pharmacy Practice, Sri Padmavathi School of Pharmacy, Tiruchanoor, Tirupati - 517503, India.<sup>2</sup>Pharm D 5<sup>th</sup> Year, Department of Pharmacy Practice, Sri Padmavathi School of Pharmacy, Tiruchanoor, Tirupati - 517503, India.<sup>3</sup>Assistant Professor, Department of Pharmacy Practice, Sri Padmavathi School of Pharmacy, Tiruchanoor, Tirupati - 517503, India.**\*Corresponding Author: Kodandaraman Thoti**

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**ABSTRACT**

Megaloblastic anemia is commonly a disease of nutritional deficiency of either vitamin B<sub>12</sub> or Folate; or both, inherited disorders of DNA synthesis. Its usual presentations are fatigue, paleness and recurrent infections. It is a rare clinical entity in pediatric age is found most exclusively in breastfed infants. Diagnosis is usually based on complete blood count and peripheral smear which may show significant macrocytosis and a raised mean corpuscular volume (MCV > 100 fL). Here we report a case of 11 months old female child who presented with complaints of fever, excessive sleep and crying during micturition. Her complete blood picture showed macrocytosis and anisocytosis on peripheral blood smear, and bicytopenia (Decreased Hemoglobin and Platelets) and low reticulocyte count. Hence diagnosis of megaloblastic anemia with accompanying feature of moderate acute malnutrition was made. Taken blood transfusion, Vit B<sub>12</sub>, Folic Acid and symptomatic treatment, and vitamin supplements. This case shows the severity of vitamin B<sub>12</sub> deficiency and suggest that all physicians be aware of megaloblastic anemia as a treatable cause of pyrexia and timely management of these patients.

**KEYWORDS:** Megaloblastic anemia, Peripheral Blood Smear, Macrocytosis, Vit B<sub>12</sub>.**INTRODUCTION**

Megaloblastic anemias are a group of disorders characterized by ineffective hematopoiesis, frequently manifested by peripheral blood cytopenia. Basic underlying pathogenetic mechanism in Megaloblastic Anemia is deficiency of folic acid and/or vit B<sub>12</sub> at the cellular level with resultant impairment of DNA synthesis. In developing countries, most cases of megaloblastic anemia result from nutritional deficiency of these micronutrients.<sup>[1,2]</sup>

Deficiency of either vitamin results in the maturation of the nucleus and cytoplasm of rapidly regenerating cells. In the hematopoietic system this synchrony results in abnormal nuclear maturation with normal cytoplasmic maturation, apoptosis, ineffective erythropoiesis, pancytopenia and typical morphological abnormalities in the blood and marrow cells.<sup>[3,4]</sup>

Pyrexia in megaloblastic anemia is a well known and reversible phenomenon. However, its characterization as the sole cause of fever is rare. The main presenting

feature in more severe cases are those of anemia. The anemia and low leukocyte count may predispose to infections, particularly of the respiratory or urinary tracts.

Megaloblastic anemia leads to substantial morbidity if unrecognized or misdiagnosed. Its etiology is multifactorial and may result from dietary deficiency, impaired absorption and transport or impaired utilization vit B<sub>12</sub> or folic acid. In India with diverse ethnic populations, different dietary and social customs, the incidence of megaloblastic anemia and its associated problems have not been adequately documented.

Diagnosis is made by significant macrocytosis (MCV>100fL), low reticulocyte count, decreased hemoglobin and platelet count along with that blood smear demonstrates marked anisocytosis, poikilocytosis however it is important to determine whether there is a specific vitamin deficiency of vit B<sub>12</sub> and folate levels. Replacement therapy is all that is needed for the treatment of Cobalamin (Vit B<sub>12</sub>) and Folate i.e Megaloblastic anemia.<sup>[6]</sup>

We report a rare case which presented with fever and diagnosed as megaloblastic anemia with moderate acute malnutrition and the aim of this article was to highlight this aspect of megaloblastic anemia and the importance of considering this diagnosis with a brief review of the existing literature and create awareness among practicing physicians about a treatable condition.

### CASE REPORT

A 11-months-old female was brought to the hospital by his parents with chief complaints of fever, since 3 days and excessive sleep. Her history of present illness states that fever was high grade, intermittent not associated with chills & rigors. Past history reveals that the baby had suffered with respiratory tract infection at 4 months of age and taken treatment and also suffered with typhoid fever 1 month back and child become weak. He was the second living child of non-consanguineous parents, and had one brother. Birth history, developmental history, immunization history and family history was normal.

On examination, child was febrile, pallor and asleep. Laboratory data revealed that marked decrease in blood indices such that (RBC)-1.28 millions/cumm, hemoglobin-4.3 g/dl, wbc-6000 cells/cumm, platelet count-82000 cells/cumm, haematocrit- 11.2%, MCV-93.3 Fl, MCH-29.3 pg, RDW- 33.3 %, reticulocyte count-0.32 %, Vit B<sub>12</sub>. 73.58 pg/ml, Ferritin-296.3ng/ml and peripheral smear examination revealed that macrocytic anisochromic moderate anisopoikilocytosis, few elliptocytes, mild polychromasia and platelets are reduced. Urine analysis reveals that albumin-2+, sugar-nil, pus cells- 4-6 found, epithelial cells 2-4 found. Sickling test was done found to be negative.



**Fig: Muscle wasting of left leg due to malnutrition.**

From the above examinations, the physician was diagnosed as Megaloblastic anemia with urinary tract infection with moderate acute malnutrition and the baby was on treatment with IV Fluids (1/2 DNS + Kcl), Inj. Cefotaxime 190mg IV TID, Syp. PCT 3ml PO QID, Syp. Domperidone 2ml/TID, Tab. Lansoprazole 1/2 tab PO OD, Inj. Vit B<sub>12</sub> 1000 IU IM Stat (Every weekly for 1 month), Syp Zinc 5ml OD, Tab. Folic Acid 1/2 tab PO OD, Syp. Haptoglobin 2.5 ml PO BD, Syp. Multivitamin 2.5 ml PO OD, Syp Ultra D<sub>3</sub> 1 ml PO OD, MgSO<sub>4</sub> mixed with food, Sporolac sachets (Lactic acid bacillus) and F<sub>75</sub>

Diet. The above mentioned therapy was continued until all the symptoms were resolved completely. The treatment was given for 15days, on 16<sup>th</sup> day the patient was discharged with vitamin supplements.

### DISCUSSION

Megaloblastic anemia is a distinct type of anemia characterized by macrocytic RBCs and typical morphological changes in RBC precursors. Deficiency of Vit B<sub>12</sub> and Folate most commonly results in megaloblastic anemia which is characterized by ineffective erythropoiesis.<sup>[8]</sup> Children usually present with generalized weakness, fatigue, failure to thrive and fever. Other findings include pallor, glossitis, vomiting, diarrhoea, seizures, developmental regression and hemorrhages.<sup>[9]</sup>

Nutritional megaloblastic anemia occurs commonly in undernourished and malnourished children; the commonest age is 3-12 months. These children are exclusively breastfed by mothers who are undernourished and have poor cobalamine and folate levels.<sup>[10]</sup> Folic acid and Vit B<sub>12</sub> are essential dietary components for human because they play a vital role in DNA synthesis.<sup>[11]</sup>

It has been suggested that patients of megaloblastic anemia are more susceptible to infection due to impaired intracellular killing of ingested bacteria by the neutrophils and macrophages. The exact cause of fever in megaloblastic anemia remains unknown. In this case, the laboratory and physical examination finding aid in supporting the diagnosis of Moderate Acute Malnutrition with Megaloblastic Anemia with Urinary Tract Infection. Symptomatic and replacement therapy was given to patient and for malnutrition baby was given vitamin supplements and F<sub>75</sub> Diet and managed conservatively for 15 days and discharged to home on 16<sup>th</sup> day with vitamin supplements. Moderate acute malnutrition was defined as low weight-for-height (Wasting) or a low height-for-age (Stunting) caused due to poverty, lack of access to food, disease and lack of safe drinking water.<sup>[12]</sup>

F<sub>75</sub> is the starter formula used during initial management of malnutrition beginning as soon as possible and continuing for 2-7 days until the child is stabilized. This is an interesting case report of Megaloblastic anemia presenting with fever, urinary tract infection and rarely malnutrition. The patient was managed conservatively and discharged.

### CONCLUSION

Megaloblastic anemia is an important cause of anemia and should be strongly suspected in all children presenting with fever and pancytopenia. Vit B<sub>12</sub> and Folate deficiency being the cause of fever would help in timely management and avoid unnecessary use of antibiotics. This case highlights the importance of

Malnutrition and fortification of diet to prevent megaloblastosis needs to be taken up as a national public health issue. Medical community should seriously consider the merit of early screening (For Vit B<sub>12</sub> and Folate) of patients with minor symptoms of anemia and muscle wasting.

## REFERENCES

1. Siddiqui B, Rabindranath B, Hayat S et al., Megaloblastic anemia: A common but often neglected cause of pyrexia of unknown origin. *Journal of Translational Internal Medicine*, 2015; 3(2): 64-67.
2. Jamal S, Imtiaz A, Naseem L. Megaloblastic anemia in early infancy. *Int.J.Pathol*, 2016; 14(4): 1-3.
3. Antony AC, Benz EJ, Shattil SJ. Hematology. Basic principles and practice. 4<sup>th</sup> edition. Edinburgh: Churchill livingstone, 2005: 519-56.
4. Carmel R, Lukens JN, Rodgers GM. Megaloblastic anemias: disorders of impaired DNA synthesis. *Wintrob's Clinical Hematology*. 11<sup>th</sup> Edition, Philadelphia: Lippincott William and Wilkins; 2004: 1367-95.
5. Khanduri U, Sharma A. Megaloblastic anemia: Prevalence and causative factors. *The National Medical Journal of India*, 2007; 20(4): 1-5.
6. Kasper, Braunwald. *Harrisons Principles Of Internal Medicine*. 16<sup>th</sup> Edition. The Mc Graw Hill Companies, 601-607.
7. Srinivas M, Ravali G. Rare presentation of megaloblastic anemia: a case report. *IJSS case reports and reviews*, 2015; 1(9): 46-48.
8. Gomber S, Kela K, Dhingra N. Clinico-hematological profile of megaloblastic anemia. *Indian Pediatric*, 1998; 35: 55-58.
9. Chabra A, Chandar V, Gupta A. Megaloblastic anemia in hospitalized children. *Journal, Indian Academy of Clinical Medicine*, 2012; 13(3): 195-7.
10. Zeb Jan A, Gul Z, Liaqat F. Megaloblastic anemia and pattern of its presentation in children. *Gomal Journal of Medical Science*, 2016; 14(2): 103-106.
11. <http://actioncontrelafaim.ca/what-is-acute-malnutrition/underlying-causes-of-malnutrition/>.
12. [http://www.who.int/nutrition/topics/moderate\\_malnutrition/en/](http://www.who.int/nutrition/topics/moderate_malnutrition/en/).