Research and Reviews: Medical & Health Sciences

Vitamin B12 Deficiency Leads to Anemia

Taha Nafees*

Department of Biochemistry, Chaitanya PG College, Kakatiya University, Warangal, Telangana, India

Review Article

ABSTRACT

Received: 10/08/2016 Revised: 15/08/2016 Accepted: 22/08/2016

*For Correspondence

Taha Nafees, Department of Biochemistry, Chaitanya PG College, Kakatiya University, Warangal, Telangana, India, Tel: 7730843555.

Keywords: Ancient ages; Medicinal Plants; Diseases; Tradition.

E-mail: tahanafees@rediffmail.com Vitamin B12 is an important vitamin required for the development of body, deficiency of it will leads to many disorders and diseases in human body. It is a known fact regarding the functionality of vitamin b12 in many important biological processes in our body.

INTRODUCTION

We can find many symptoms caused due to deficiency of vitamin B12, few of them are listed below, Anemia caused by a vitamin B12 deficiency, along with it one can find other symptoms, such as:, a sore and red tongue (glossitis), changes in the way that you walk and move around, irritability, depression, disturbed vision, changes in the way you think, mouth ulcers, pins and needles (paraesthesia), feel and behave a decline in your mental abilities, a pale yellow tinge to your skin such as memory, understanding and judgement (dementia).

If anyone finds these symptoms one should check their B12 content there body.

Requirement of vitamin b12 by human body

Different stages of life	Vitamin B12 required
Children 1 to 3 years	0.9 mcg
Adults	2.4 mcg
Pregnant teenagers and	
women	2.6 mcg

Results of vitamin B12 deficiency

One of the important role of vitamin B12 is synthesis of red blood cell, including nerve tissue maintenance and functioning of nervous system ^[1-30].

Study revealed continuous deficiency of vitamin B12 leads to serious anemia, damages nerve and brain, if left untreated these will be irreversible ^[31-63].

In few studies it is found that Vitamin B12 deficiency leads to pernicious anemia, it's a form of blood disorder ^[64-80]. In case of pernicious anemia people cannot produce the amount of intrinsic factor in stomach required by normal human being ^[81-92]. For absorption of vitamin B12 intrinsic factor is needed, in this conditions it is suggested for injections of vitamin B12 injecting directly into bloodstream, such that avoiding stomach. Apart from intrinsic factor vitamin B12 helps absorbing folic acid, helpful in energy needs of body ^[93-100].

According to the study, both in USA and UK 6% of humans above 60 years are affected with vitamin B12 deficiency. This is more commonly found in developing countries.

Preventing B12 deficiency

Vitamin B12 can be supplemented from many food items like eggs, meat, fish, dairy foods and cereals.

REFERENCES

- 1. http://www.medicalnewstoday.com/articles/172774.php?page=2
- 2. http://www.nhs.uk/Conditions/Anaemia-vitamin-B12-and-folate-deficiency/Pages/Symptoms.aspx
- 3. Chen TS, Hsieh CY (2016) Vitamin B12 Deficiency Resulting in Subacute Combined Degeneration in the Spinal Cord and a Typical Magnetic Resonance Image. J Neurol Neurophysiol 7:352.
- 4. Kadhim G, Maidin MS, Omar H, Ismail A (2015) Identification of Vitamin B12 Deficiency in Helicobacter pylori Infected Patients. J Bioengineer & Biomedical Sci 5:160.
- 5. Boaz M, Raz O, Sternlib R (2015) Serum Vitamin B12 Levels in Two Subpopulations of Healthy Workers in Israel: Differences by Land of Birth. J Nutr Disorders Ther 5:173.
- 6. Andres E, Vogel T, Lang PO (2015) Food-Cobalamin Malabsorption: A Controversial Etiology of Symptomatic Vitamin B12 Deficiency. J Blood Disord Transfus 6:301.
- Kumar R, Vyas K, Jaiswal G, Bhargava A, Kundu J (2015) Correlation of Clinical and MRI Features of Neuropsychiatric Manifestations in Sub-acute Combined Degeneration of Spinal Cord: Neurological Syndrome Associated with Vitamin B12 Deficiency. J Psychol Psychother 5:194.
- 8. Yokus O, Gedik H (2015) A Case with Pancytopenia and Autoimmune Hemolytic Anemia due to Vitamin B12 Deficiency. J Blood Disord Transfus S5:002.
- 9. Kosker M, Tanriverdio C, Dostbil A, Tomcuk T, Kalabak AA (2015) Vitamin B12 Deficiency as a First Sign of Acquired Horizontal PandularNystagmus. J Neuroinfect Dis 6:168.
- 10. Kumudha A, Sarada R (2015) Effect of Different Extraction Methods on Vitamin B12 from Blue Green Algae, Spirulina Platensis. Pharm Anal Acta 6:337.
- 11. Masferrer D, Sánchez H (2015) Vitamin B12 Deficiency in Older Diabetic Patients: Is it Necessary to Create Guidelines for Early Diagnosis, Monitoring and Treatment of this Nutritional Problem? J Diabetes Metab 6:487.
- 12. Rehman HU(2014) Many Faces of Vitamin B12 Deficiency. J Clin Case Rep 4:e139.
- 13. Tanyildiz HG, Malbora B, Yesil S, Tekgunduz SA, Candir MO, et al. (2014) Vitamin B12 Deficiency Mimicking Acute Leukemia in a Child. J Clin Case Rep 4:430.
- 14. Das D, Haloi A (2014) Vitamin B12 Gene Polymorphisms and Chronic Diseases. J Nutr Disorders Ther 4:149.
- 15. Siddiqua JT, Allen HL, Raqib R, Ahmed T (2014) Vitamin B12 Deficiency in Pregnancy and Lactation: Is there a Need for Pre and Postnatal Supplementation?. J Nutr Disorders Ther 4:142.
- 16. Medeiros FC, Albuquerque LAF, Pereira CA (2014) Thoracic Spinal Cord Atrophy Due to Vitamin B12 Deficiency. J Neurol Disord 2:i101.
- 17. Handono K, Sari TL, Adam AA (2014) Homocysteine, Folic Acid, Vitamin B6, Vitamin B12, and Biochemical Parameters of Bone Metabolism in Female Patients with Systemic Lupus Erythematosus. J Clin Cell Immunol 5:217.
- 18. Wang ZJ, Wang HY, Wang P, Zhang Y, Chu J, et al. (2014) Enhance Vitamin B12 Production by Online CO2 Concentration Control Optimization in 120 m3 Fermentation. J Bioprocess Biotech 4:159.

- 19. Smith J, Coman D (2014) Vitamin B12 Deficiency: an Update for the General Paediatrician. Pediat Therapeut 4:188.
- Andrès E (2012) Oral Cobalamin (Vitamin B12) Therapy: From Empiricism and Personal Experience to Evidence Based Medicine and Perspective of Recommendations and Guideline. J Blood Disord Transfus 3:e102.
- 21. Aggarwal A, Wood I (2012) Low Vitamin B12 Syndrome in Trigeminal Neuralgia. J Pain Relief 1:109.
- 22. Chatterjee T, Das A (2016) Clinical Emergencies Presented by Anemia. Emerg Med (Los Angel) 6:327.
- 23. Samson AA, Ogbenna AA (2016) Morphologic Evaluation of Anemia I. Biol Med (Aligarh) 8:322.
- 24. Kim SH, Kang Mk, Kim HK, Chun KJ, Choi J, et al. (2016) Factors Associated with Left Atrial Enlargement in Patients with Anemia Caused by Uterine Myoma. J Clin Exp Cardiolog 7:456.
- 25. Kelleni MT (2016) Rituximab: Is it Possible to Link Both Autoimmune Haemolytic Anemia and Aplastic Anemia Regarding the Etiology and Management?. Gen Med (Los Angeles) 4:e110.
- 26. Hernandez HE, Htway Z, Eichner A (2016) Baseline Anemia Analysis of Hispanic Dialysis Patients with and without Type 2 Diabetes . J Mol Histol Med Physiol 1:105.
- 27. Manzo C (2016) About a Gastric Neuroendocrine Tumor Presenting as Polymyalgia Rheumatica and Macrocytic Anemia. J Clin Case Rep 6:784.
- 28. Barik S (2016) Megaloblastic Anemia: A Drug-Induced Disorder. J Blood Disord Transfus 7: 359.
- 29. Panneerselvam J, Shen Y, Che R, Fei P (2016) Fanconi Anemia Group D2 Protein Participates in Replication Origin Firing. Chemo Open Access 5: 206.
- 30. Malla TM, Zargar MH, Dar FA, Shah ZA (2016) Clastogen-Induced Chromosomal Breakage Analysis of Suspected Fanconi's Anemia Cases of Kashmir, North India. J Genet Syndr Gene Ther 7: 295.
- 31. Hernandez GH, Soto ICF, Garcia CAJ (2016) Cameron Lesions: Keep in Mind in Chronic Anemia. J Hepatol Gastroint Dis 2:125.
- Imai E, Nakade M, Kasaoka T, Takimoto H (2016) Improved Prevalence of Anemia and Nutritional Status among Japanese Elderly Participants in the National Health and Nutritional Survey Japan, 2003-2009. J Nutr Food Sci 6:495.
- Fadel MG, Yoong W, Luis J (2016) Severe Iron-Deficiency Anemia on Maternal and Neonatal Outcomes. J Preg Child Health 3:242.
- 34. Messenger H, Lim B (2016) The Prevalence of Anemia in Pregnancy in A Developed Country How Well Understood is it?. J Preg Child Health 3:231.
- 35. Essa N, El-Ashwah S, Denewer M, Essam Y, Mabed M (2016) Autoimmune Hemolytic Anemia in a Patient with Acute Myelomonocytic Leukemia. J Blood Disord Transfus 7:336.
- 36. Damanhouri GA, Jarullah JS (2016) Clinical Genotypic Correlation of Beta S-Globin Haplotypes in Sickle Cell Anemia. J Blood Disord Transfus 7:335.
- 37. Dhawan D, Chaudhary S, Chandratre K, Ghosh A, Sojitra N, et al. (2015) Prenatal Screening for Co-Inheritance of Sickle Cell Anemia and β-Thalassemia Traits. Clin Med Biochemistry Open Access 2:108.
- Wenderlein D, Scarcella P, Zimba I, Luhanga R, Mancinelli S, et al. (2016) Antiretroviral Treatment-Associated Hepatotoxicity and Anemia in Patients Receiving Stavudine or Zidovudine Containing Regimens in Sub-Saharan African Settings. J AIDS Clin Res 7:537.
- 39. Galle J (2015) Continuous Erythropoietin Receptor Activator (C.E.R.A.) Treatment of Renal Anemia in Patients with Chronic Kidney Disease: A Two-Year Observational Study. J Nephrol Ther 6:228.
- 40. Zulfiqar AA, Mahdi R, Mourot-Cottet R, Pennaforte JL, Novella JL, et al. (2015) Autoimmune Hemolytic Anemia A Short Review of the Literature, with a Focus on Elderly Patients . J Hematol Thrombo Dis 3:228.
- 41. Mura P, Deiana M, Musu M, Finco G (2015) Prolonged Severe Anemia and Transfusion Refusal Following Abdominal Surgery. A Case Report and Short Literature Review. J Blood Disord Transfus 6:328.
- 42. Yu PP, Chang YZ, Yu P (2015) Iron Liposome: A more Effective Iron Supplement for Sports Anemia and Anemia of Inflammation. J Pharma Care Health Sys S4:002.
- 43. Muraoka A, Aizawa K, Misawa Y (2015) Intractable Hemolytic Anemia after Heart Valve Surgery. J Blood Disord Transfus 6:322.
- 44. Guner SI, Yanmaz T, Karacetin D, Aydin MF, Atca AO, et al. (2015) Microangiopathic Hemolytic Anemia (MAHA), High Alkaline Phosphatase and D-dimer Levels and Bone Marrow Infiltration as the First Presentation of Metastatic Signet Ring Cell Carcinoma of Gastric Origin: A Rare Case Report. J Cancer Clin Trials 1:101.

- 45. Shizuma T (2015) Pernicious Anemia in Patients with Primary Biliary Cirrhosis, Autoimmune Hepatitis, and Chronic Viral Hepatitis. J Liver 4:186.
- 46. Varghese SJ, Kumar R, Lumai A, Tawfwiq L (2015) Isolated Defect of Intestinal Iron Absorption in Siblings of Iron Deficiency Anemia. J Hematol Thrombo Dis 3:220.
- 47. Milman N (2015) Postpartum Anemia Still a Major Problem on a Global Scale. J Preg Child Health 2:e122.
- 48. Huang G (2015) A New Strategy for the Treatment of Anemia. J Cell Sci Ther S8:001.
- 49. Fatima B, Demmouche A (2015) Role of Serum Transferrin Receptor in Diagnosis of Iron Deficiency Anemia: Report of 130 Cases in West of Algeria. J Blood Disord Transfus 6:305.
- 50. Mihiretie H, Fufa M, Mitiku A, Bacha C, Getahun D, et al. (2015) Magnitude of Anemia and Associated Factors among Pregnant Women Attending Antenatal Care in Nekemte Health Center, Nekemte, Ethiopia. J Med Microb Diagn 4:197.
- 51. Jamal M, Hameed A, Imtiaz F (2015) Burden of Anemia in Malarial Parasite Infection. J Infect Dis Ther 3:228.
- 52. Alzu'bi AA (2015) Simvastatin-Induced Pleuro-Pericardial Effusion and Megaloblastic Anemia. J Gen Practice 3:198.
- 53. Charles CV, Dewey CE, Hall A, Hak C, Channary S, et al. (2015) A Randomized Control Trial Using a Fish-Shaped Iron Ingot for the Amelioration of Iron Deficiency Anemia in Rural Cambodian Women. Trop Med Surg 3:195.
- 54. Yokus O, Gedik H (2015) A Case with Pancytopenia and Autoimmune Hemolytic Anemia due to Vitamin B12 Deficiency. J Blood Disord Transfus S5:002.
- 55. Salifou K, Obossou AAA, Sidi IR, Bib H, Anf H, et al. (2015) Factors Associated With Anemia in Pregnant Women in 2014 in Parakou. J Preg Child Health 2: 174.
- 56. Ferraz M (2015) Aseptic Pulp Necrosis of a Tooth in Sickle Cell Anemia. J Interdiscipl Med Dent Sci 3:103.
- 57. Rusu A, Kacso I, Racasan S, Caprioara GM (2015) Interleukin 17 and Pro-hepcidin in Anemia and Erythropoietin esponsiveness of Chronic Kidney Disease Patients Treated with Hemodialysis. Med chem 5:290-294.
- 58. Hajar TL, Rostom S, Hari A, Lahlou R, Bahiri R, etal. (2015) Prevalence of Anemia and its Association with Parameters of Rheumatoid Arthritis Patients: A Study from the Moroccan Quest - RA Data. J Palliat Care Med 5:221.
- 59. Argaw B, Argaw-Denboba A, Taye B, Worku A, Worku A (2015) Major Risk Factors Predicting Anemia Development during Pregnancy: Unmatched-Case Control Study. J Community Med Health Educ 5: 353.
- 60. ShizumaT (2015) Concomitant Cases of Primary Biliary Cirrhosis and Autoimmune Hemolytic Anemia: Literature Review. Intern Med 5:189.
- 61. Nkwabong E, Kasia JM (2015) Should We Revisit The Current Definition Of Anemia In Pregnancy? J Preg Child Health 2:e111.
- 62. Amara AAAF (2015) The Need for Early Detection of the Prototype Mutants: Sickle Cell Anemia as a Case Study. J Proteomics Bioinform S8:006.
- 63. Salman MA (2015) Anemia in Patients with Diabetes Mellitus: Prevalence and Progression. Gen Med (Los Angel) 3:162. doi: 10.4172/2327-5146.
- 64. Gavin R Armstrong and Alastair JS Summerlee (2014) The Etiology, Treatment and Effective Prevention of Iron Deficiency and Iron Deficiency Anemia in Women and Young Children Worldwide: A Review. J Women's Health Care 4:213.
- 65. Nazmul Huda Md, Daya Shankar Mishra, Singh JP (2014) Clinical Evaluation of an Ayurvedic Preparation for the Treatment of Iron Deficiency Anemia in Patients. J Homeop Ayurv Med 3:162.
- 66. Mwenda V, Musa M (2014) Challenges in Diagnosing Pernicious Anemia: A Case Series. J Hematol Thrombo Dis 2:174.
- 67. Adedemy JD, Agossou J, Noudamadjo A, Sanda GS, Gbetoho J, et al .(2015) Effect of Iron Supplementation in the Prevention of Anemia Associated with Malaria in Children Aged 6 to 59 Months in Bakperou (Benin) in 2013. Pediat Therapeut 5:222.
- 68. Chukwu BF, Ezenwosu OU, Eke CB, Chinawa JM, Ikefuna AN, et al. (2014) What Factors Influence the Age at Diagnosis of Sickle Cell Anemia in Enugu, Nigeria? J Blood Disord Transfus 5:231.
- 69. Schettini JAC, Coelho ICCAN, Amorm MMR, Torres LC (2014) Phenotypic Analyses of T, B, NK and NKT Cells in a Human Fetus with D and C Alloimmune Anemia. Transcr Open Access 4:140.

- Chaouch L, Kalai M, Jbara BM, Darragi I, Chaouachi D, et al. (2014) Association of MCP1-2518A/G and CCR2 –V64I Polymorphisms and Vaso-occlusive Crisis among Sickle Cell Anemia Tunisian Patients. Microinflammation 1:104.
- 71. Mohammed Salhab, Ali Zaidi, Iffat Adeel, Sana Saeed , Azra Raza et al. (2014) Three Cases of Refractory Anemia with Ringed Sideroblasts Who Responded to Chloroquine. J Blood Lymph 4:125.
- 72. Monsef JB, Boettner F (2014) Hypotensive Anesthesia may Result in False Anemia and Increase Transfusion Requirements in Total Hip Arthroplasty. J Anesth Clin Res 5:425.
- 73. Bove I, Campoy C, Uauy R, Miranda T (2014) Smoking during Pregnancy: A Risk Factor for Stunting and Anemia in Infancy. Int J Sch Cog Psychol 1:109.
- 74. Niihara Y, Macan H, Eckman JR, Koh H, Cooper ML, et al. (2014) L-Glutamine Therapy Reduces Hospitalization for Sickle Cell Anemia and Sickle β°-Thalassemia Patients at Six Months – A Phase II Randomized Trial. Clin Pharmacol Biopharm 3:116.
- 75. Suksompong S, Bormann BV (2014) Does Preoperative Anemia Deteriorate Patients' Postoperative Outcome or about the Difficulty of Comprehension. J Blood Disord Transfus 5:205.
- 76. Inaba T, Okamoto Y, Yamazaki S, Takatani T, Satoh N, et al. (2014) Hemolytic Anemia with Fragmented Red Blood Cells Following Vascular Access Grafting for Hemodialysis in a Patient with Chronic Kidney Disease. J Blood Disord Transfus 5:201.
- 77. Shizuma T (2014) Autoimmune Hemolytic Anemia Following Influenza Virus Infection or Administration of Influenza Vaccine. J Blood Disord Transfus 5:200.
- 78. Osman KS, Aly LH, El-Hamid WMA, Tawfik MR (2014) Role of Hepcidin in the Pathogenesis of Anemia Not Caused by Iron Deficiency. J Clin Cell Immunol 5:193.
- 79. Hassan BAR (2013) Anemia of Chronic Diseases (ACD). Nat Prod Chem Res 2:e104.
- 80. Marotta S, Giagnuolo G, Basile S, Pagliuca S, Grimaldi F, et al. (2014) Excellent Outcome of Concomitant Intensive Immunosuppression and Eculizumab in Aplastic Anemia/Paroxysmal Nocturnal Hemoglobinuria Syndrome. J Hematol Thromb Dis 2:128.
- 81. Singh G, Issa D, Sedki E, Hanouneh I, Lopez R, et al. (2013) Anemia in Patients with Chronic Hepatitis C Infection during Triple Therapy with Telaprevir or Boceprevir - A Controlled Study. J Antivir Antiretrovir 5:173-177.
- 82. Jufar AH, Zewde T (2014) Prevalence of Anemia among Pregnant Women Attending Antenatal Care at Tikur Anbessa Specialized Hospital, Addis Ababa Ethiopia. J Hematol Thromb Dis 2:125.
- 83. Liljeholm M, Gronlund E, Golovleva I, Sandström H, Wahlin A (2013) Erythrocyte Flow Cytometric Analysis in Congenital Dyserythropoietic Anemia Type III-Evaluation of Eosin-5⁻-Maleimide, CD55, and CD59. J Blood Disord Transfus 4:172.
- 84. Morales-Borges RH (2013) Anemia in Pregnancy & Parenteral Iron Therapy. J Blood Disord Transfus 4:171.
- 85. Cooling L, Boxer G, Simon R (2013) Life-Threatening Autoimmune Hemolytic Anemia Treated with Manual Whole Blood Exchange with Rapid Clinical Improvement. J Blood Disord Transfus 4:163.
- Queiroz AMM, de Castro Lobo CL, do Nascimento EM, de Bragança Pereira B, Bonini-Domingos, et al. (2013) The Mean Corpuscular Volume and Hydroxyurea in Brazilian Patients with Sickle Cell Anemia: A Surrogate Marker of Compliance. J Blood Disord Transfus 4:157.
- 87. Ballas SK, Singh P, Adams-Graves P, Wordell CJ, (2013) Idiosyncratic Side Effects of Hydroxyurea in Patients with Sickle Cell Anemia. J Blood Disord Transfus 4:162.
- 88. Khoj L, Baksh R, Aslam M, Kelta M, Albeirouti B, et al. (2013) A Case of Dengue Fever-Induced Severe Aplastic Anemia Salvaged by Allogeneic Bone Marrow Transplant. J Leuk (Los Angel) 1:120.
- 89. Boateng L, Puffer E, Allen T, Bonner M, Thornburg CD (2013) Adherence to Secondary Stroke Prevention in Children with Sickle Cell Anemia: Family and Child Perspectives. J Blood Disord Transfus 4:148.
- 90. Dominico SA, Janmohamed M, Magesa A, Jaka H, Rambau PF, et al. (2012) Coombs Negative Hemolytic Anemia of Unknown Origin in Pregnancy. J Blood Lymph 2:103.
- 91. Sugawara Y, Shigemasa Y, Hayashi Y, Abe Y, Eriko Ueno IO (2013) New Mode (Molecular-Sensing) of Heinz Body Formation Mechanisms Inherent in Human Erythrocytes: Basis for Understanding of Clinical Aspects of Drug-Induced Hemolytic Anemia and the Like. J Bioanal Biomed 5:036-056.
- 92. Khan I, Inoue S, Mushtaq R, Onwuzurike N (2013) EBV Infection Resulting in Aplastic Anemia: A Case Report and Literature Review. J Blood Disord Transfus 4:141.

- 93. Hemamalini J (2013) Anemia in Relation to Body Mass Index and Waist Circumference among Andhra Pradesh Women. J Obes Weight Loss Ther 3:173.
- 94. Jaime-Pérez JC, González-Llano O, Cantú-Rodríguez OG, Marfil-Rivera LJ, Gómez-Almaguer D (2013) Long-Term Remission and Bone Marrow Findings in Children with Severe Aplastic Anemia Immunosuppressed with High Doses of Cyclophosphamide. J Bone Marrow Res 1:112.
- 95. Wankhade V, Andhale RB, Lodha S (2013) Diverse Clinical manifestations by Sickle Cell Anemic Patients of District Amravati, MS India. J Blood Disord Transfus 4:136.
- 96. Bayupurnama P, Taroeno-Hariadi KW (2012) The Development of Coldtype Autoimmune Hemolytic Anemia during Peginterferon alfa-2a plus Ribavirin Treatment in Chronic Hepatitis C Patient: a Case Report. J Clin Case Rep 2:173.
- 97. Premalatha T, Valarmathi S, Srijayanth P, Sundar JS, Kalpana S (2012) Prevalence of Anemia and its Associated Factors among Adolescent School Girls in Chennai, Tamil Nadu, INDIA. epidemiol 2:118.
- 98. Williams-Hooker R, Olivi S, Smeltzer MP, Wang WC (2012) Health-Related Quality of Life is Associated with Hemoglobin Level in Children with Sickle Cell Anemia. J Blood Disord Transfus 3:129.
- 99. Rafie M, Rahmani H, Sadr M, Forat M, Behnamfar Z, et al. (2012) Prevalence and Treatment of Iron Deficiency Anemia in Patients with Chronic Heart Failure. J Clin Exp Cardiolog 3:205.
- 100. Nik Rosmawati NH, Mohd Nazri S, Mohd Ismail I (2012) The Rate and Risk Factors for Anemia among Pregnant Mothers in Jerteh Terengganu, Malaysia. J Community Med Health Educ 2:150.