International Scientific Peer Reviewed Journals

Journal of Biomedical Engineering Research

Article Id: jber-2019070003

*Corresponding author
Nasrullah,
Department of Molecular Biology and Biotechnology,
Bahauddin Zakariya University, Pakistan.
Email: nasrullahkakar007@gmail.com

Rana Khalid Iqbal,
Department of Molecular Biology and Biotechnology,
Bahauddin Zakariya University, Pakistan.
Email: khalid.iqbal@bzu.edu.pk

Natasha Khalid,
Department of Molecular Biology and Biotechnology,
Bahauddin Zakariya University, Pakistan.

Article Information
Received date: Jul 03, 2019
Accepted date: Jul 04, 2019
Published date: Jul 27, 2019

Review Article

Anemia Symptoms, Causes, Prevention, Diagnosis and Treatment

Nasrullah*, Natasha Khalid, Rana Khalid Iqbal

Institute of Molecular Biology and Biotechnology, Bahauddin Zakariya University, Pakistan.

Abstract

Anemia is a disease in which we do not have enough and healthy red blood cells that contain iron containing protein hemoglobin (protein which carry out oxygen from lungs and transport it to all parts of body), anemia have many types everyone with its own cause, it can either be long term or temporary. Anemia occurs when blood loss due to physical injury or due to menstruation in female [1]. It has symptoms like the r sickle shape hemoglobin and lack of normal shape of it. It can be prevented by eating balance diet and also using iron supplements. Anemia symptoms are fatigue and yellowish skin and eyes and feeling fever all the time.

Keywords: Anemia, malnutrition, deficiency

Introduction

Anemia is a condition in which you lack healthy red blood cells that transfer proper amount of oxygen to the all parts of body. The word “Anemia” explain itself an” mean without and “Anemia” mean red blood cells. If you have anemia then you feel fatigue and weakness all the day. Anemia may be defined as a hemoglobin concentration in body and it vary from person to person and gender to gender. The concentrations of hemoglobin in men that have anemia is below 13g/dl and in young girls of more than 15 have below 12g/dl [2]. And it may be for long duration and its condition may be vary from mild to severe in different people. It is curable at early stage and at acute stage it is serious and may be fatal [3].

Anemia is recognized as one of the most important nutritional deficiencies impacting maternal health globally. The World Health Organization (WHO) estimates that 32 million pregnant women were affected by anemia in 2011 [4].

Symptoms

Anemia symptoms are different due to the cause of the anemia you have and their signs and symptoms are fatigue and weakness [5]. all the time, pale or yellowish skin, abnormal heart beats, short breath, sleeping all the time, chest or back pain, headache, their hand feet are cold all the time and they do not perform their routine work and are lazy all the time [6].

Causes

- **Iron deficiency Anemia** This is the most common type of Anemia worldwide. Iron deficiency anemia is caused by a shortage of iron in your body. Your bone marrow needs iron to make Hemoglobin. Without adequate iron, your body can't produce enough hemoglobin for red blood cells. Without iron supplementation, this type of anemia occurs in many pregnant women. It is also caused by blood loss, such as from heavy menstrual bleeding, an ulcer, cancer and regular use of some over-the-counter pain relievers, especially aspirin.
- **Vitamin deficiency anemia** in addition to iron, your body needs folate and vitamin B-12 to produce enough healthy red blood cells. A diet lacking in these

and other key nutrients can cause decreased red blood cell production. Additionally, some people may consume enough B-12, but their bodies aren't able to process the vitamin. This can lead to vitamin deficiency anemia, also known as pernicious anemia.

- **Anemia of chronic disease** Certain diseases — such as cancer, HIV/AIDS, rheumatoid arthritis, kidney disease, Crohn's disease and other chronic inflammatory diseases — can interfere with the production of red blood cells.
- **Aplastic anemia** This rare, life-threatening anemia occurs when your body doesn't produce enough red blood cells. Causes of aplastic anemia include infections, certain medicines, autoimmune diseases and exposure to toxic chemicals.
- **Anemias associated with bone marrow disease** A variety of diseases, such as leukemia and myelofibrosis, can cause anemia by affecting blood production in your bone marrow. The effects of these types of cancer and cancer-like disorders vary from mild to life-threatening.
- **Hemolytic anemias** This group of anemias develops when red blood cells are destroyed faster than bone marrow can replace them. Certain blood diseases increase red blood cell destruction. You can inherit a hemolytic anemia, or you can develop it later in life.
- **Sickle cell anemia** This inherited and sometimes serious condition is an inherited hemolytic anemia. It's caused by a defective form of hemoglobin that forces red blood cells to assume an abnormal crescent (sickle) shape. These irregular blood cells die prematurely, resulting in a chronic shortage of red blood cells.
- **Other anemias** There are several other forms of anemia, such as thalassemia and malarial anemia [7].

Certain infectious diseases, pregnancy and age also causes severe anemia at the age greater than 65 it may become severe if it is not control at the start [3]. Intestinal diseases, family background, alcoholism, sickle cell anemia, hemolytic anemia, malarial anemia also leads to chronic anemia [8].

Genes

Mutations in the TMPRSS6 gene cause iron-refractory iron deficiency anemia. This gene provides instructions for making a protein called matriptase-2, which helps regulate iron levels in the body. TMPRSS6 gene mutations reduce or eliminate functional matriptase-2, which disrupts iron regulation and leads to a shortage of iron in the bloodstream. Iron is an essential component of hemoglobin, which is the molecule in red blood cells that carries oxygen. When not, enough iron is available in the bloodstream, less hemoglobin is produced, causing red blood cells to be abnormally small and pale. The abnormal cells cannot carry oxygen effectively to the body's cells and tissues, which leads to fatigue, weakness, and other symptoms of anemia [9].

Tests

Anemia becomes complicated when it is not identified at initial stage so when its symptoms appear then concern the doctor. The test for anemia is CBC (complete blood count) which tell the exact composition of your blood then it tells either you are anemic or no [10]. If your red blood cells that contain iron containing protein hemoglobin that carry oxygen to all parts of body are less than normal value then you are anemic and if it is normal level then you are normal and not anemic patient [11].

Complications of anemia

Anemia causes many complications if it is not treated at initial stages. It causes severe fatigue when it becomes complicated and that person feels sick and tired all the time.

Left untreated, anemia can cause many health problems, such as:

- Severe fatigue When anemia is severe enough, you may be so tired that you can't complete everyday tasks.
- Pregnancy complications Pregnant women with folate deficiency anemia may be more likely to experience complications, such as premature birth [11].
- Heart problems Anemia can lead to a rapid or irregular heartbeat (arrhythmia). When you're anemia your heart must pump more blood to compensate for the lack of oxygen in the blood. This can lead to an enlarged heart or heart failure [12].
- Death Some inherited anaemia's, such as sickle cell anemia, can be serious and lead to life-threatening complications. Losing a lot of blood quickly results in acute, severe anemia and can be fatal [10].

Some types of anemia are inherited like sickle cell anemia and thalassemia are more dangerous and are fatal [12].

Preventions

Anemia is fatal disease when it becomes complicated so it should ne control at initial stage or adopts preventive measures to avoid it [13]. Eat iron rich diets like mutton, beef and other all types of meats you want to eat. Beans, nuts, green vegetables like spinach, eat full grain cereals, dried fruits, multivitamins, eat all fruits and their juices but eat vitamin rich C fruits [3].

Treatment

Anemia is an iron deficiency disease so it can be treated by using iron containing foods like green vegetables like spinach and others all vegetables and also eat dates. When people have anemia to overcome the deficiency of iron it is necessary to use iron supplement and multivitamins tablets [10]. When it becomes very complicated then blood transfusion becomes necessary. It becomes very complicated in young girls due to menses and also in pregnant women so they need proper treatment. Because it is more common in females than males [14].

Conclusion

Anemia is very serious disease for females so they should be aware about it. It is also common in children and old ages above 65. People are not aware about anemia many people died due to anemia when it becomes complicated especially pregnant women [15]. It is our moral duty to aware the public about anemia by social media and by arranging seminars. People should be aware about symptoms, preventions, and treatments of anemia. In this way we can reduce the anemia from society [16].

References

1. Estcourt, Lise J, Patricia M Fortin, Marialena Trivella and Sally Hopewell. 2016. "Europe PMC Funders Group Preoperative Blood Transfusions for Sickle Cell Disease." 2016.
2. Contaldo, Antonella, Giuseppe Losurdo, Francesca Albano and Andrea Iannone, et al. 2019. "The Spectrum of Small Intestinal Lesions in Patients with Unexplained Iron Deficiency Anemia Detected by Video Capsule Endoscopy." Published online 2019 Feb 27. 2019 Mar; 55(3): 59.

3. Estcourt Lise J, Patricia M Fortin, Marialena Trivella and Sally Hopewell."Europe PMC Funders Group Preoperative Blood Transfusions for Sickle Cell Disease." 2016.
4. "Global Technical Strategy for Malaria 2016-2030 - World Health Organization - Google Books." n.d. 2019.
5. Conroy Andrea L, Dibyadyuti Datta and Chandy C John. "What Causes Severe Malaria and Its Complications in Children ? Lessons Learned over the Past 15 Years," 10–13. 2019
6. Lengline Etienne, Bernard Drenou, Paul Coppo, Pierre Peterlin and Olivier Tournilhac et al. "Nationwide Survey on the Use of Eltrombopag in Patients with Severe Aplastic Anemia : A Report on Behalf of the French Reference Center for Aplastic Anemia" 103 (2). 2018.
7. Preema J. Mehta, , Sherita Chapman, Annapurni Jayam-trouth and Mohankumar Kurukumbi. "Case Report Acute Ischemic Stroke Secondary to Iron Deficiency Anemia : A Case Report" . 2012 (c).
8. Douglas J. Perkins, Tom Were, Gregory C Davenport, Prakasha Kempaiah and James B Hittner et al. "Severe Malarial Anemia : Innate Immunity and Pathogenesis." 2011.
9. De Falco L, M. Sanchez, L. Silvestri, C. Kannengiesser and M. U. Muckenthaler "Iron Refractory Iron Deficiency Anemia." 2013.
10. Young Kyung Lee, Hee-jin Kim, Kyunghoon Lee, Sang Hyuk Park and Sang Hoon Song, et al. "Recent Progress in Laboratory Diagnosis of Thalassemia and Hemoglobinopathy : A Study by the Korean Red Blood Cell Disorder Working Party of the Korean Society of Hematology" 54 (1). 2019.
11. Sarah Myers, Precious Dinga, Margot Anderson, Charles Schubert and Rachel Mlotha, et al. "Use of Bubble Continuous Positive Airway Pressure (BCPAP) in the Management of Critically Ill Children in a Malawian Paediatric Unit : An Observational Study," 1–11. 2019
12. Polina, Petkova-kirova, Laura Hertz, Jens Danielczok, Rick Huisjes and Asya Makhro, et al."Red Blood Cell Membrane Conductance in Hereditary Haemolytic Anaemias" 10 (April): 1–17. 2019.
13. Haldar, K. and Mohandas N. "Malaria, erythrocytic infection, and anemia. ASH Education Program Book", 2009(1), 87-93. (2009).
14. Kejo, Dyness, Pammla Petrucka, Haikael Martin, Theobald C E Mosha and Martin E Kimanya. "Efficacy of Different Doses of Multiple Micronutrient Powder on Haemoglobin Concentration in Children Aged 6 – 59 Months in Arusha District" 2019.
15. Lambrecht, Nathalie J, Mark L Wilson and Andrew D Jones. "Assessing the Impact of Animal Husbandry and Capture on Anemia among Women and Children in Low- and Middle-Income Countries : A Systematic Review," 331–44. 2019.
16. Zemenu Yohannes Kassa, Tegibelu Awraris, Alemneh Kabeta Daba and Zelalem Tenaw. "Compliance with Iron Folic Acid and Associated Factors among Pregnant Women through Pill Count in Hawassa City , South Ethiopia : A Community Based Cross- Sectional Study," 10–17. 2019.

Citation: Nasrullah, Iqbal RK, Khalid N. Anemia symptoms, causes, prevention, diagnosis and treatment. J Biomed Engg Res. 2019; 1(1): jber-2019070003.