

HAEMOLYSIS ASSOCIATED WITH MALARIA INFECTION: A THREAT TO HUMAN EXISTENCE**Obeagu Emmanuel Ifeanyi*^{1,2}, Ochei Kingsley Chinedum³ and Mbah Promise U.²**¹Medical Laboratory Science, University Health Services, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria.²Department of Medical Laboratory Science, Imo State University, Owerri, Nigeria.³Measure Evaluation, John Snow, Inc., Abuja, Nigeria.***Corresponding Author: Obeagu Emmanuel Ifeanyi**

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ABSTRACT

Malaria has been a serious threat to lives of persons living in developing countries including Nigeria. A lot of persons have been researching on getting vaccine to immunize persons against this life-threatening infection. Malaria infection uses haemolysis of red blood cells to cause the anaemia seen in the infected patients. The parasites utilise a lot of mechanisms in causing in haemolysis of erythrocytes of the patients. The paper was written to x-ray malaria associated haemolysis.

KEYWORDS: Haemolysis, erythrocytes, malaria infection.**HAEMOLYSIS AND MALARIA**

Malaria is the most common infectious disease that causes of haemolytic anaemia worldwide (Spach *et al.*, 1993). Sporozoites that are released from the mosquito enter the hepatocytes. One to two weeks after merozoites get into the circulation. Haemolysis in malaria is linked to erythrocytic infestation by plasmodium organism binding to the red blood cell membrane at the Duffy antigen site and the attaches a tubular proboscis via the membrane. As it does this, the plasmodium is wrapped into an invaginated erythrocytic membrane pocket but remains extracellular. Infested erythrocytes are carefully removed from the blood stream by the spleen with some erythrocytes reentering blood stream after splenic pitting of parasites. Previously infested erythrocytes manifest membrane and metabolic deformability. In addition the plasmodium species digests the host erythrocytes haemoglobin for its own use as a nutrient (WHO, 2011). The severity of the haemolytic process is related to the level of parasitaemia and may increase by hypersplenism. *Plasmodium vivax* and *P.ovale* only invade mature red blood cells. *Plasmodium falciparum* invades erythrocytes of all ages and therefore leads to a higher degree of parasitism. With *P. falciparum* infection, intravascular haemolysis may be severe and erythrocytopenia, due to reduced deformability of infected erythrocytes. Diagnosis of malaria is based on identification of parasite-infected erythrocytes on a thick wright stained blood smear. Chemoprophylaxis should be offered to all people planning to travel to known endemic areas. The haemolytic anaemia to malaria

resolves after successful therapy with chloroquine, pyrimethamine, and sulfonamides or sulfone compounds. All of these agents may be associated with drug-induced haemolysis in patients with G6PD deficiency (Wright, 1999).

Infection may lead to haemolysis through many mechanisms. As observed with parasites, infectious organism can directly invade red blood cells leading to premature removal by the reticuloendothelial system. Also, haemolytic toxins may be produced by the organism and lead to damage of erythrocyte membrane. Hypersplenism may ensue leading to haemolysis in G6PD deficient individuals. Anaemia that results from concomitant acute or chronic infection is likely to be multifactorial with the anaemia of chronic disease often co existing IgG and IgM are immune antibodies produced in response of antigens. Sometimes they are directed against its own red blood cells leading to autoimmune haemolytic anaemia (Sawitsky and Ozaeta, 1970). The lifetime of the red blood cells is reduced just in a few days in serious cases (Shenfield, 2008). The intracellular components of the red blood cells are released into the blood stream and into tissues, leading to some of the characteristic symptoms of the condition. The antibodies are usually directed against high- incidence antigens; therefore, they also commonly act on allogenic erythrocytes (Gehr and Friedberg, 2002). Autoimmune haemolytic anaemia (AIHA) is a relatively rare condition, affecting 1-3 people per 100,000 people per year (Bottiger and Westerholm, 1973).

CONCLUSION

Malaria is a major public health threat in developing countries especially Nigeria. Malaria has taken many lives in this part of the world. Malaria is transmitted by bites of infected mosquito to persons releasing the sporozoites which enter the liver from there the merozoites are released in the erythrocytes. Haemolysis is a major mechanism that malaria infection uses in causing anaemia in patients which is highly devastating in the affected patients. Haemolysis should be prevented in the patients to prevent malaria associated acute or chronic anaemia. All hands must be on deck to stop the ravaging menace of malaria infection in the endemic areas like our part of the world.

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