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NEW EMERGING TRENDS IN *Plasmodium vivax* MALARIA WITH THROMBOCYTOPENIA

Dr. Kamana Sharma*, Ms. Manisha Baliyan, Dr. Shanti Rajora*** & Ms. Sangeeta******
Animal, Veterinary and Fishery Sciences
Department of Zoology, R.G. (P.G.) College, Meerut

Abstract

A descriptive study was carried out in 50 patients suffering from Plasmodium vivax caused malaria in Meerut and nearby region. Besides usual clinical presentations of vivax malaria such as fever, headache chills and sweating, thrombocytopenia was observed in 80 % of the patients. Thus serious and life threatening complications can occur with vivax malaria. There is an urgent need to re-examine the clinical spectrum and burden of Plasmodium vivax malaria.

Keywords-: *Plasmodium vivax,* Complications, thrombocytopenia.

INTRODUCTION

Malaria has emerged once again as a major health problem of India. It is a life threatening parasitic disease caused by infection of erythrocytes with four species of protozoan parasites of genus namely *Plasmodium vivax, Plasmodium falciparum, Plasmodium malariae and Plasmodium ovale.*Meerut region is dominated by *Plasmodium vivax.* It is transmitted by the bite of female anopheles mosquito. These parasites are peculiar to man who constitutes their intermediate host and in whose red blood corpuscles they live and multiply and may give rise to periodic fever associated with fever, headache, anemia, chills and sweating.

Severe and complicated malaria is usually caused by the *Plasmodium falciparum* but it has been increasingly observed that *Plasmodium vivax* malaria which was otherwise considered to be the benign malaria with low case fatality rate, can also result in severe presentations like

thrombocytopenia, hepatomegaly, renal failure etc. The present study is aimed to findout *Plasmodium vivax* caused complications in Meerut and nearby areas.

MATERIALS AND METHODS

RDT (Rapid diagnostic test)

The suspected malaria patients were diagnosed by Rapid diagnostic test (Moody 2002 and Aslan *et al*.2001) for malaria It is a rapid colored immunochromatography assay for qualitative determination of antibodies of malarial parasites (p. f. /p. v.) in human blood. Nitro cellulose membrane of the test device is immobilized with highly specific recombinant antigens (Merozoite Surface Protien: MSP) of Pf at test line zone 1 and recombinant antigen (MSP) of Pv at test line zone 2. Human blood containing malarial antibodies is allowed to react with recombinant Pf/ Pv antigens coupled gold conjugate followed by reaction with recombinant antigens immobilized at test line zones. Appearance of pink /purple visible line in result window at test line zone (1&2) in addition to pink /purple line "C" at control line zone, indicates positive test result. Appearance of pink/ purple line at control line "C" validates the procedure. Absence of any band in the test regions suggests a negative result. Appearance of pink/ purple line at "C" and 1 indicates *Plasmodium falciparum* infection and appearance of pink/ purple line at "C" and 2 indicates *Plasmodium vivax* infection while the appearance of pink/ purple line at "C" 1and 2 indicates mixed infection with *Plasmodium vivax* and *Plasmodium falciparum* (Warhurst and Williams,1996).

GIEMSA STAIN

The antigen positive patients were examined microscopically for confirmation of species by Giemsa stain (Garcia, 2001).

FLUORESCENT MICROSCOPY - The antigen positive patients were also examined by fluorescent microscopy. The whole blood was collected by venipuncture or fingertip into the collection tube containing the anticoagulant (EDTA).The blood is filled into microcapillary which is coated with acridine orange. The fluorescence dye Acridine orange has an affinity for the nucleic acid in the parasite nucleus. The malaria parasite picks up fluorescent stain into their nucleus and cytoplasm, so that its morphological characteristics can be examined by fluorescent microscopy when excited by UV light at appropriate wavelength. The centrifugal quantitative buffy coat or QBC combines an acridine orange coated capillary tube and an internal float is formed. The float occupies the area midpoint between red cells and plasma and settle at different levels in the capillaries (Nandwani *et al.* 2003).

RESULTS AND DISCUSSION

The present study is based on 50 severe malaria patients which were admitted to a multispeciality hospital at Meerut from April to June 2012. (Summer season).

For the identification of species, Rapid Diagnostic Test was performed. RDT positive patients were confirmed for the species by Giemsa stain and fluorescent microscopy and detailed clinical observations were made. Besides the regular features of patient suffering from *vivax* malaria such as fever, chills, anemia, spleen and liver damage, thrombocytopenia was observed in 80 % of patients.

Thrombocytopenia is not a regular feature of *Plasmodium vivax* malaria but recently it has been reported worldwide. Previously, it was believed that it is more common in *falciparum* malaria. Studies have shown that thrombocytopenia is equally or even more common in *Plasmodium vivax* malaria contrary to the popular belief that it may be observed in *Plasmodium falciparum* malaria (Aggarwal *et al.* (2005), Anstey et al.(1992), Bhatia and Bhatia (2010), Harish and Gupta (2009), Jadhav et al .(2004), Kakar et al.(1999) Kaur *et al*.(2007), and Kumar and Shashirekha (2006). Recent studies conducted from the Indian subcontinent have found significant thrombocytopenia in *Plasmodium vivax* malaria (Srivastava et al.(2011), and George and Alexander (2010). A recent study from Iran confirms that they are getting more cases of thrombocytopenia due to *Plasmodium vivax* than *falciparum* and attributes this to the possible development of a new genotype of *Plasmodium vivax* (Metanat and Sharifi-Mood (2010). Thrombocytopenia may be a predicator of malaria and the speculated mechanism leading to thrombocytopenia are coagulation disturbances, splenomegaly, bone marrow alterations, antibody mediated platelet destruction, oxidative stress and the role of platelets as cofactor in triggering severe malaria (Khan *et al.* 2012 , Faseela *et al*. 2011, Jamal Khan *et al*.2008 and Rasheed *et al*. 2008).

Thus, the trend of disease with *Plasmodium vivax* malaria is changing. It is increasingly recognised that serious and life threatening complications can occur with *vivax* malria. There is an urgent need to re-examine the clinical spectrum and burden of *Plasmodium vivax* malaria so that adequate control measures can be implemented against this emerging but neglected disease.

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