

PROBLEM OF MALARIA INFECTION

Soebaktiningsih*

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Abstract

Malaria is still Public Health Problem in tropical country. Failure of Mefloquine – Artesunate combination treatment of uncomplicated Plasmodium falciparum beginning to fail is due to the delayed clearance times and elevated Artesunate IC50, suggest that Artesunate resistance may be emerging on background of Mefloquine resistance (Rogers et al 2009).

Pathogenesis of malaria in pregnancy is related to the ability of Plasmodium falciparum intra erythrocyte to sequester in the placenta. Study to understand the molecular basis of susceptibility to malaria in pregnancy has been advanced through the discovery of Chondroitin Sulfat A (CSA) molecule that support the accumulation of infected erythrocytes (IE) by Plasmodium falciparum in the placenta.

Keyword : *Plasmodium falciparum, Mefloquine – Artesunate, malaria in pregnancy*

INTRODUCTION

Malaria is Public Health problem especially in tropical country, resistance of Plasmodium to anti malarial drugs, resistance of Anopheles mosquito as transmitter of malaria to some insecticides and also malaria in pregnancy. Many researches have been done concerning malaria epidemiologically and also biomoleculary.

Failure of Mefloquine – Artesunate treatment of uncomplicated Plasmodium falciparum malaria, resistance to anti malarial drugs hampers control efforts the risk of morbidity and mortality from malaria. Spread of drug resistance Plasmodium falciparum complicate malaria control. Chloroquin resistance near universal. Resistance to second line drugs (Fansidar, Mefloquine, Quinine) common in South East Asia. Artemisinin combination therapy is new foundation of malaria treatment. Unrealistic to hope that Artemisinin resistance will not emerge.

Pregnant women and children pose the highest risk of malaria primigravidae and secundigravidae are more susceptible to malaria in pregnancy (MIP) than multigravidae. Pathogenesis of MIP is related to the ability of Plasmodium falciparum intra erythrocyte to sequester in the placenta. Study to understand the molecular basis

of susceptibility to MIP has been advanced through the discovery of Chondroitin Sulfat A (CSA) molecule that support the accumulation of infected erythrocytes (IE) by Plasmodium falciparum in the placenta. The major consequences of MIP are anemia in mother and low birth weight babies. Adhesion of IE is mediated by Plasmodium falciparum Erythrocyte Membrane Protein 1 (PfEMP1), a variant parasite protein expressed on the surface of IE and encoded by var gene, var 2CSA is a member of var gene that is dominantly expressed by the parasites adhered to the placenta, suggesting its importance to be induced in vaccine component in pregnancy. Antibody to the particular Variant Surface Antigen (VSA) could protect from malaria complications is gender specific and the recognition activity to VSA is increased with parity.

The aim of the studies are:

1. The efficacy of standard therapy for uncomplicated Plasmodium falciparum .
2. To measure the level of var2CSA expression in infected pregnant women, assess both peripheral and placental parasitemia by blood film and histology respectively and measure the antibody response to particular VSA type.

* Medical Faculty, University of Muhammadiyah Malang

THE METHODE

One hundred fifty one subjects with uncomplicated *Plasmodium falciparum* received 12 mg/ kg Artesunate and 25mg/ kg Mefloquine. Subjects were followed for 42 days, PCR genotyping of *msp1*, *msp2*, and *glurp* to distinguish treatment failure from new infections were used and also Real Time PCR to measure the copy number of *pfmdr* gene and used standard 25mg/ kg Mefloquine. Subjects were followed for 42 days, PCR genotyping of *msp1*, *msp2*, and *glurp* to distinguish treatment failure from new infections were used and also Real Time PCR to measure the copy number of *pfmdr* gene and used standard 48 hour isotopic hypoxanthine incorporation assays to measure IC₅₀ for anti malarial drugs.

The molecular basis of susceptibility to malaria in pregnancy (MIP) was done through the discovery of Chondroitin Sulfat A (CSA) molecule.

THE RESULT

Among *Plasmodium falciparum* infected subjects, 47,0% were still parasitemic on day 2 and 11,3% on day 3. The PCR corrected treatment failure rates determined by survival analysis at 28 and 42 days were 13,1% and 18,8% respectively. Treatment failure was associated with increased *Pfmdr* 1 copy number, higher initial parasitemia, higher Mefloquine IC₅₀ and longer time to parasite clearance

Current findings demonstrated that placental isolates expressed higher level of var2CSA transcripts compared to peripheral isolates of the same pregnant women. Histology analysis revealed that approximately 40% of women in whom peripheral parasitemia were heavily infected with parasites harbored much less parasitemia in their placenta.

DISCUSSION

The result suggest that Artesunate – Mefloquine combination is beginning to fail. It is unclear whether the treatment failures are due solely to Mefloquine resistance or to Artesunate resistance as well. The findings of delayed clearance times and elevated Artesunate IC₅₀ suggest that Artesunate resistance may be emerging on background of Mefloquine resistance (Rogers et al 2009).

Antibody reactivity of sera taken from pregnant women infected with malaria and non infected individuals showed that pregnant women infected with malaria have higher antibody response to parasites dominantly expressing var2CSA than the non pregnant individuals as detected by Fluorescence Activated Cell Sorter (FACS) (Rintis 2009).

CONCLUSION

1. Combination therapy for *Plasmodium falciparum* with Artesunate – Mefloquine beginning to fail, it is suggest that Artesunate resistance may be emerging on background of Mefloquine resistance
2. In pregnant woman with malaria showed that Chondroitin Sulfat A (CSA) molecule support the accumulation of infected erythrocytes (IE) by *Plasmodium falciparum* in the placenta.

REFERENCE

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