

MUTASI TITIK GEN *pfcr* PADA PENDERITA MALARIA FALCIPARUM UMUR 1-18 TAHUN DI KABUPATEN OGAN KOMERING ULU PROVINSI SUMATERA SELATAN

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FALCIPARUM MALARIA; CHLOROQUINE

KKA KK Dis K 06/12 Mar m

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ABSTRAK

Mutasi titik gen *pfcr* pada penderita malaria falciparum umur 1-18 tahun di Kabupaten Ogan Komering Ulu Provinsi Sumatera Selatan

Rosiana A Marbun

Temuan dalam beberapa tahun terakhir menyebutkan bahwa resistensi *P. falciparum* terhadap klorokuin terutama diperankan oleh mutasi pada gen *P. falciparum chloroquine resistance transporter (pfcr)*. Tujuan penelitian ini adalah untuk mengidentifikasi dan mendeskripsikan pola distribusi mutasi titik gen *pfcr* *P. falciparum* berdasarkan demografi dan tofografi di Ogan Komering Ulu (OKU) Sumatera Selatan. Penelitian ini merupakan penelitian deskriptif eksploratorik pada anak berumur 1-18 tahun di 3 daerah endemis malaria yang mewakili OKU Sumatera Selatan yaitu Tanjung Lengkayap, Banding Agung, dan Belitang. Tahapannya adalah penentuan *spleen rate*, pengumpulan subyek, diagnosis malaria klinis, pemeriksaan mikroskopis sediaan tebal dan tipis spesimen darah, uji resistensi klorokuin *in vivo*, isolasi DNA, PCR, dan *sequencing*. Nilai *spleen rate* ke 3 daerah tersebut dikelompokkan ke dalam kategori hipoendemis malaria. Diperoleh 171 sampel dengan malaria falciparum. Pada uji resistensi klorokuin *in vitro* 25 sampel gagal, dan 146 sampel berikutnya dilanjutkan uji resistensi *in vivo*, didapat 44 sampel yang resisten terhadap klorokuin. Berhasil dilakukan isolasi 168 sampel DNA gen *pfcr*, PCR, dan *sequencing*, didapatkan mutasi titik pada kodon 74, 75, 76, 97, 220, dan 356 yaitu M74I, N75L, K76T, H97F, A220S, dan I356L. Pola distribusi mutasi titik di Tanjung Lengkayap, Banding Agung, dan Belitang 100% pada kodon 74,75,76, dan 356, sedangkan pada kodon 97 berturut-turut 44%, 46,9%, dan 60%, pada kodon 220 berturut-turut 40,5%, 46,9%, dan 60%. Kesimpulan adalah Distribusi mutasi titik pada kodon 97 dan 220 dijumpai paling banyak di Belitang. Didapatkan mutasi titik lokal baru pada kodon 75 dan 97 gen *pfcr* *P. falciparum* belum pernah dijumpai di tempat lain.

Kata kunci: Malaria falciparum, klorokuin, resistensi, mutasi titik gen *pfcr*

ABSTRACT**Point Mutations of Pfcrt Gene in Patients aged 1-18 years with Falciparum Malaria in Ogan Komering Ulu District in South Sumatra Province****Rosiana A Marbun**

The findings in recent years state that the resistance of *P. falciparum* to chloroquine mainly caused by the mutation in the *P. falciparum* chloroquine resistance transporter (*pfcr*t) gene. The objectives of this study were to identify and describe the distribution pattern of point mutations *P. falciparum* *pfcr*t gene based on demographics and topography in Ogan Komering Ulu (OKU), South Sumatra. This study was a descriptive exploratory study in children aged 1-18 years in three malaria-endemic areas which represents OKU-South Sumatra, namely the Tanjung Lengkayap, Banding Agung, and Belitang. The stages of this research were the determination of spleen rate, collecting subjects, clinical malaria diagnosis, microscopic examination of thick and thin stocks of blood specimens, test of chloroquine resistance in vivo, DNA isolation, PCR, and sequencing. Based on the value of spleen rate, those 3 regions were grouped into hypoendemic malaria. One hundred seventy-one (171) samples were obtained with falciparum malaria observed by microscopic examination of thin blood supply. Twenty-five (25) samples failed the test of chloroquine resistance in vitro, and the next 146 samples would be proceeded to take resistance test in vivo which, later, it was found that 44 samples were resistant to chloroquine. One hundred sixty-eight (168) samples of *pfcr*t gene DNA were successfully analyzed by conducting isolation, PCR, and sequencing. As a result, a point mutation was found at codons 74, 75, 76, 97, 220, and 356, namely M74I, N75L, K76T, H97F, A220S, and I356L. The pattern of distribution of point mutations in Tanjung Lengkayap, Banding Agung, and Belitang was 100% in codons 74,75,76, and 356, while at codon 97 was respectively 44%, 46.9%, and 60%, , at codon 220 was respectively 40.5%, 46.9%, and 60%. This research concluded that distribution of point mutations at codons 97 and 220 were mostly found in Belitang. A new local point mutation at codons 75 and 97 of *P. falciparum* *pfcr*t gene was found. This has never been found in other places.

Keywords: falciparum malaria, chloroquine, resistance, point mutations of *pfcr*t gene