

INTISARI

Latar belakang: *Glucose-6-Phosphate Dehydrogenase* defisiensi (G6PDd) merupakan kelainan enzimopati terkait kromosom-X. Kelainan ini mempunyai prevalensi tinggi terutama di daerah endemis malaria. Pada tahun 2013 sebanyak 3-5 juta penduduk Indonesia terinfeksi malaria dengan kasus tertinggi di Indonesia Bagian Timur dengan spesies *Plasmodium falciparum* 62 % dan *Plasmodium vivax* 33 % dominan dengan API 15,6 per 1.000 populasi. Pengukuran aktivitas enzim G6PD dan *genotyping* varian G6PD penting dilakukan di wilayah endemik malaria karena salah satu antimalaria primakuin (PQ) dapat menyebabkan hemolisis pada individu dengan G6PDd. Penelitian ini bertujuan menganalisis distribusi dan varian G6PD secara molekuler di wilayah endemik malaria di Kab. TTS, Prov. NTT.

Metode: Survei dengan total 555 individu sehat yang dipilih secara sistematis random sampling dari 5 kecamatan. Kriteria inklusi, usia >14 tahun dan Hb >10 gr/dL. Pengumpulan data menggunakan kuisioner standar, pemeriksaan fisik dan uji laboratorium (Hb, mikroskopis, *nested* PCR, dan sekuensing). Protokol PCR dan *nested* PCR mengikuti petunjuk dari Kit PCR Promega, Madison, USA. Defisiensi enzim G6PD adalah individu dengan aktivitas enzim dari hasil pengukuran < 6,97 U/grHb dan kasus malaria adalah individu positif ditemukan *Plasmodium* dari hasil mikroskopis maupun *nested* PCR. Seluruh kasus G6PDd dan malaria selanjutnya dilakukan pemetaan menggunakan ArcGIS V.9.1 dan SatScan. Analisis statistik menggunakan bivariat dan multivariat dengan $\alpha:0.05$ dan 95 % CI menggunakan *software* SPSS 16.0.

Hasil: Total 555 dari 558 responden diketahui sebanyak 16,6 % (92/555) dengan G6PDd. Analisis molekuler seluruhnya diketahui varian G6PD *Vanua Lava* 10.884 T C, 11% (6/56) dengan satu wanita heterozygote. Analisis multivariat menyimpulkan penurunan kadar Hb dan riwayat konsumsi antimalaria merupakan faktor risiko terhadap kejadian hemolisis ($p: <0,05$). Prevalensi kasus malaria hasil mikroskopis dan *nested* PCR 32,6 % (181/555) dengan *Plasmodium vivax* dominan 51,9 % (94/181). Analisis spasial ditemukan tiga pengelompokan kasus G6PDd dan malaria ($p: <0,05$) dengan pola distribusi penderita G6PDd ditemukan di seluruh wilayah penelitian.

Kesimpulan: Varian G6PDd *Vanua Lava* 10.884 T C ditemukan di Kab. TTS. Sebaran kasus G6PDd ditemukan diseluruh wilayah penelitian.

Kata kunci: G6PDd, *Vanua Lava*, *P. vivax*, Kab. TTS, Indonesia Bagian Timur.

ABSTRACT

Background: Glucose-6-phosphate dehydrogenase deficiency (G6PDd) is a cytoplasmic enzyme. The major function of G6PD is prevention of oxidative damage to cells by promoting detoxification of free radicals. G6PD deficiency common in populations living in malaria endemic areas. In 2013, 3-5 million Indonesian population were infected with malaria and mostly in Eastern Indonesia by two dominant species of malaria *Plasmodium falciparum* 62 % and *Plasmodium vivax* 33 % with API 15.6 per population. G6PD variant genotype were important for malaria patients. Primaquine (PQ) currently the only approved drug recommended in radical cure. The use of PQ in G6PDd individuals presents serious risks may induce life-threatening haemolytic events. This study will assess the distribution and variant molaculer G6PDd in South Timor Tengah District, Eastern Indonesia.

Method: 555 of 558 healthy population in 5 districts in Central South Timor District, Eastern Indonesia were selected by systematic random sampling. Data collected by standard questionnaire, physical examination and laboratory tests (Hb, PCR,, nested PCR and sequencing). All protocols followed by manufactures manual Promega, Madison, USA. Confirmed cases of G6PDd and malaria were map using ArcGIS and SatScan. Statistical analysis by multivariate with $\alpha = 0,05$ and 95% CI was performed with SPSS 16.0 software package.

Result: Among the 555 samples enrolled, 16.6 % (92/555) had G6PD deficiency were 40 males and 51 females, and one female G6PDd was heterozygous. All molecular G6PD variant analysis 11 % (6/56) were *Vanua Lava* 10.884 T C. Multivariate result decreased Hb and anti-malarial (Pq) history as the most risk factors hemolysis ($p < 0.05$). Malaria identification by microscopic and nested PCR 32.6 % (181/555) were positive malaria infection with *Plasmodium vivax* 51.9 % (94/181) as the dominating species. While spatial analysis indicated three distinguish significant clusters with $p < 0.05$ were G6PDd found in all studies areas.

Conclusion: G6PDd, *Vanua Lava* variant is common in Eastern Indonesia, distribution of G6PDd were found in all studies areas.

Key words: G6PDd, *Vanua Lava*, *P. vivax*, East Central Timor (SCT) District, Eastern Indonesia.