



## The Relationships between SORD -888G>C Gene Polymorphism and Diabetic Retinopathy in a South Sumatran Malay Population

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### ABSTRACT

The sorbitol dehydrogenase (SORD) enzyme has 2 promoter regions with polymorphisms at -1214 C>G (rs2055858) and -888 G>C (rs3759890), which have a complete imbalance, related to gene expression in retinal cells of diabetic patients, and more likely to have a role in diabetic retinopathy (DR) pathogenesis. The SORD -888G>C genotype occurs more often in Japanese DR patients than in patients without complications. A relationship between DR and the G allele in -888G>C polymorphism is observed in Diabetes Mellitus (DM) type-2 patients. This study aims to elucidate the relationship between the SORD -888 G>C gene polymorphism to the occurrence of DR cases in Malay population in South Sumatra. This is a case-control study. Malay DM type-2 patients who undergo direct ophthalmoscopy and fundus imaging in the Dr. Mohammad Husein Central General Hospital eye clinic in Palembang, South Sumatra, Indonesia were the subjects of this study. Patient DNA was isolated from blood samples, PCR analyzed and sequenced in order to determine the polymorphism frequencies of the SORD -888 G>C gene. The results showed that every subject had GG genotype in SORD -888 G>C gene promoter. There was no observable polymorphism in SORD -888G>C gene in the authentic Malay population in South Sumatra.

**Keywords:** SORD-888 G>C polymorphism, Malay population, South Sumatera

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### INTRODUCTION

Diabetic retinopathy (DR) has the potential to cause blindness in diabetes mellitus (DM) patients. The probability of this complication is escalating along with the increasing duration of DM in patients. [1,2,3] This complication prevalence in DM patients is 28.5% with a threat to eye vision capability for about 30%, with 15% blind. [2,3] The *Diab Care Asia* report in 2008, involving 1758 DM patients in 18 primary and secondary health services in Indonesia, revealed that 42% of DM patients will get retinopathy

complication, in which about 6.4% is proliferative DR. [4]

Blindness caused by DR is related to the obstruction and damage in capillaries in the retina. Chronic hyperglycemia conditions trigger the cascade of physiological and biochemical alterations that lead to micro vascular damage and retinal disfunction. [5] *The Diabetes Control and Complications Trial* (DCCT) and the *United Kingdom Prospective Diabetes Study* (UKPDS) found that there is a strong correlation between chronic hyperglycemia and DR, but the mechanism is not clear. [5,6] Some of the biochemical pathways between hyperglycemia and DR have been investigated. Under hyperglycemic conditions, glucose flux will increase via polyol pathway, where aldose