

# Hubungan polimorfisme gen matrix metalloprotein-9 -1562 c>t dan 836 a>g terhadap perkembangan penyembuhan luka penderita ulkus kaki diabetes mellitus tipe 2 di RSCM = The Relations of matrix metalloprotein -9 -1562 c>t dan 836 a>g gene polymorfism with diabetic foot ulcer healing progress in diabetic patient at Cipto Mangunkusumo Hospital

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## Abstrak

Latar Belakang. Peningkatan jumlah penderita ulkus kaki diabetes berdasarkan data epidemiologi saat ini ternyata setiap tahunnya terus meningkat. Faktor genetik berperan dalam proses penyembuhan luka ulkus kaki diabetes dan peranan faktor genetik terhadap penyembuhan luka penderita ulkus kaki diabetes belum banyak diteliti terutama di Indonesia. Matrix Metalloproteinases MMPs merupakan proteolitik enzim yang memegang peranan pada proses remodeling connective tissue dan degradasi extracellular matrix.

Polimorfisme pada gen MMP-9 diduga kuat mempengaruhi proses terjadinya ulkus dan proses penyembuhan luka pada penderita ulkus kaki diabetes.

Metode Penelitian: Tujuan penelitian ini adalah menganalisis hubungan polimorfisme gen Matrix metalloprotein- 9 -1562 C>T dan 836 A>G dengan perkembangan penyembuhan luka ulkus kaki penderita diabetes mellitus tipe 2. Rancangan penelitian adalah sebuah penelitian prospektif potong lintang. Penelitian ini dilakukan di Divisi Bedah Vaskular dan Endovaskular FKUI/RSCM Jakarta bekerjasama dengan Laboratorium Biologi Biomolekuler FKUI/RSCM Jakarta selama periode September 2016 - Desember 2016. Populasi target adalah penduduk Jakarta, populasi terjangkau adalah pasien Ulkus Diabetik yang berobat di divisi bedah vascular dan endovascular FKUI/RSCM Jakarta. Besar sampel ditentukan berdasarkan formula uji hipotesis dua proporsi. Dilakukan analisis DNA dan polimorfisme gen MMP-9. Dilakukan dokumentasi foto klinis luka ulkus kaki diabetes pada saat luka sebelum debrideman dan di hari ke 21, kemudian diukur luas luka dan jaringan granulasi dengan menggunakan program ImageJ.

Hasil: Perkembangan penyembuhan luka terdapat pada Polimorfisme gen Matrix Metalloprotein-1562C>T CC yaitu sebanyak 17 dari 32 orang 31,48 , CT yaitu sebanyak 9 dari 21 orang 16,67, hasil uji statistik dengan nilai  $p=0,477$ . Polimorfisme gen Matrix Metalloprotein 836A>G AA yaitu sebanyak 10 dari 14 orang 18,52, AG yaitu sebanyak 9 dari 19 orang 16,67, GG yaitu 7 dari 21 orang 12,96, Hasil uji statistik  $p = 0,087$ . Kesimpulan. Kedua polimorfisme gen MMP-9 tersebut tidak terdapat hubungan bermakna.

*Background:* According to epidemiology data, amount of diabetic ulcer patients is continue to increase. Genetic factor has a role in diabetic foot ulcer healing and the role of genetic it self in managing the ulcer only has a few study or publication conducted in Indonesia. Matrix Metalloproteinase MMPs is the proteolytic enzyme which has role in connective tissue remodeling process and extracellular matrix degradation. MMP 9 genes polymorphism is strongly predicted influencing ulcer formation process and ulcer healing process in diabetic foot ulcer patients.

*Methods:* The goal of this study is to analyze the relation between MMP 9 genes polymorphism with the progress of ulcer healing di diabetic foot ulcer patient. This is a cross sectional prospective study design at Vascular surgery and Endovascular division, surgery department FKUI RSCM Jakarta cooperated with

Biology Biomolecular laboratory at FKUI RSCM during September december 2016. Target population are all Jakarta citizens, and accessible population are all diabetic foot ulcer patients in Vascular surgery and Endovascular division FKUI RSCM, Jakarta. Sample size is determined based on dual proportion hypothesis test formula. Blood sample are taken and sent to biology medic laboratory to perform DNA and MMP 9 gene polymorphism analysis. The characteristic of ulcer is documented before and on day 21, then the ulcer size and granulation tissue are measured using ImageJ program.

Results: Improvement of healing ulcer in gene polymorphism of matrix metalloproteinase 1562C T CC is about 17 from 32 patients 31,48 , CT is about 9 from 21 patients 16,67 , statistic testing with p value 0,477. Gene polymorphism metalloproteinase 836A G AA is 10 from 14 patienrs 18,52, AG is 9 from 19 patients 16,67, GG is 7 from 21 patients 12,96, statistic testing with p value 0,087. Conclusions There are not significant relationship in both of MMP 9 gene polymorfsm with diabetic foot ulcer healing progress