

## Prediction of wound healing in diabetic foot ulcers : an observational study in tertiary hospital in Indonesia

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### Abstrak

**Aim:** to evaluate the role of clinical characteristics, functional markers of vasodilation, inflammatory response, and atherosclerosis in predicting wound healing in diabetic foot ulcer.

**Methods:** a cohort study (February-October 2010) was conducted from 40 subjects with acute diabetic foot ulcer at clinical ward of Dr. Cipto Mangunkusumo National Central General Hospital, Jakarta, Indonesia. Each subject underwent at least two variable measurements, i.e. during inflammatory phase and proliferation phase. The studied variables were clinical characteristics, complete peripheral blood count (CBC) and differential count, levels of HbA1c, ureum, creatinine, lipid profile, fasting blood glucose (FBG), marker of endothelial dysfunction (asymmetric dimethylarginine/ADMA, endothelin-1/ET-1, and flow-mediated dilation/FMD of brachial artery), and marker of vascular calcification (osteoprotegerin/OPG).

**Results:** median of time achieving 50% granulation tissue in our study was 21 days. There were nine factors that contribute in the development of 50% granulation tissue, i.e. family history of diabetes mellitus (DM), previous history of wound, wound area, duration of existing wound, captopril and simvastatin medications, levels of ADMA, ET-1, and OPG. There were three out of the nine factors that significantly correlated with wound healing, i.e. wound area, OPG levels, and simvastatin medications.

**Conclusion:** in acute diabetic foot ulcers, wound area and OPG levels had positive correlation with wound healing, whereas simvastatin medications had negative correlation with wound healing.

.....Tujuan: mempelajari peran faktor risiko klinis, penanda fungsi vasodilatasi, respons inflamasi, dan aterosklerosis dalam memprediksi penyembuhan luka kaki diabetik. Metode: studi kohort dilakukan sejak Februari – Oktober 2010 terhadap 40 subyek penelitian dengan ulkus diabetik akut di ruang rawat inap RSUPN Dr. Cipto Mangunkusumo, Jakarta, Indonesia. Pada setiap subyek, dilakukan minimal dua kali pengukuran variabel, yaitu pada fase inflamasi dan proliferasi. Variabel yang diteliti berupa karakteristik klinis, pemeriksaan darah perifer lengkap (DPL) dan hitung jenis, HbA1c, ureum, kreatinin, profil lipid, glukosa darah puasa (GDP), penanda disfungsi endotel (asymmetric dimethylarginine/ADMA, endothelin-1/ET-1, dan flow-mediated dilation/FMD arteri brakialis), dan penanda kalsifikasi vaskular (osteoprotegerin/OPG).

**Hasil:** waktu rerata tercapainya jaringan granulasi 50% pada penelitian ini adalah 21 hari. Terdapat sembilan faktor yang berperan dalam pembentukan 50% jaringan granulasi, yaitu riwayat DM pada keluarga, riwayat luka, luas luka, lama luka, pemakaian kaptopril dan simvastatin, konsentrasi ADMA, ET-1, dan OPG. Terdapat tiga dari sembilan faktor yang secara signifikan berkorelasi terhadap penyembuhan luka, yaitu luas luka, konsentrasi OPG, dan pemakaian simvastatin.

**Kesimpulan:** pada ulkus diabetik akut, luas luka dan konsentrasi OPG memiliki korelasi positif terhadap penyembuhan luka, sementara pemakaian simvastatin memiliki korelasi negatif terhadap penyembuhan luka.