INTISARI

Pengaruh Cedera Iskemia Reperfusi Ginjal terhadap *Remodeling* Pembuluh Darah serta Ekspresi *Endothelin-1* (ET-1) dan *endothelial Nitric Oxide Synthase* (eNOS) pada Mencit

Pratiwi Indah Sayekti[1], Nur Arfian[2], Dian Prasetyo Wibisono[2]

[1]Mahasiswa S1 Fakultas Kedokteran Universitas Gadjah Mada
[2]Dosen Fakultas Kedokteran Universitas Gadjah Mada

Latar belakang: Cedera ginjal akut mengalami peningkatan insidensi yang disertai dengan angka kematian di seluruh dunia. Selain angka kematian yang tinggi, pasien dapat mengalami komplikasi berupa Penyakit Ginjal Kronis dan *End-Stage Renal Disease.* *Endothelin-1* dan *endothelial nitric oxide synthase* berperan dalam proses cedera ginjal iskemia reperfusi yang disertai dengan *remodeling* pembuluh darah.
Tujuan: Mengetahui pengaruh cedera iskemia reperfusi ginjal terhadap *remodeling* pembuluh darah, ekspresi ET-1, dan ekspresi eNOS.
Metode: Dilakukan klem hilus renalis pada 15 ekor mencit jantan galur Swiss umur 3-4 bulan selama 30 menit. Hewan coba dikelompokkan menjadi 3 kelompok secara acak, yakni kelompok IR1 (n=5), IR12 (n=5), dan *Sham Operation* (SO, n=5). *Remodeling* vaskular dinilai dengan area lumen dan ketebalan dinding; ekspresi ET-1 dan eNOS dengan PCR. Analisis dengan uji *one way* ANOVA dengan *post-hoc* LSD. Level signifikan pada p<0,05.
Hasil: Didapatkan penurunan signifikan diikuti peningkatan signifikan area lumen (SO vs IR1 p=0,003; SO vs IR12 p=0,170; IR1 vs IR12 p=0.039). Terdapat peningkatan ketebalan dinding arteri tidak signifikan diikuti penurunan signifikan (SO vs IR1 p=0,076; SO vs IR12 p=0,323; IR1 vs IR12 p=0,012). Ekspresi ET-1 mengalami kenaikan signifikan lalu menurun signifikan (SO vs IR1 p=0,001; SO vs IR12 p=0,125; IR1 vs IR12 p=0,035). Ekspresi eNOS mengalami kenaikan di IR1 dan turun di IR12, namun perubahannya tidak signifikan.
Kesimpulan: Pada cedera iskemia reperfusi, terjadi *remodeling* pembuluh darah yang salah satu penyebabnya adalah peningkatan ekspresi ET-1. Ekspresi eNOS diyakini berperan sebagai mekanisme adaptasi terhadap cedera vaskuler sehingga arsitektur vaskuler dapat mengalami perbaikan.
Kata kunci: cedera ginjal akut, cedera iskemia reperfusi, *remodeling* pembuluh darah, ET-1, eNOS.

ABSTRACT

Effect of Renal Ischemic Reperfusion Injury on Vascular Remodeling and *Expression of Endothelin-1* (ET-1) and *endothelial Nitric Oxide Synthase* (eNOS) in Mice

Pratiwi Indah Sayekti[1], Nur Arfian[2], Dian Prasetyo Wibisono[2]

[1]Undergraduate student of Faculty of Medicine Universitas Gadjah Mada
[2]Lecturer in Faculty of Medicine Universitas Gadjah Mada

Background: The incidence of acute kidney injury increased over time with increased mortality and complication, such as chronic kidney failure and end-stage renal disease. Endothelin-1 and eNOS have been known to play role in ischemic reperfusion injury followed by vascular remodeling.
Objective: The aim of this study is to examine the pattern of vascular remodeling, ET-1 expression, and eNOS espression in ischemic reperfusion injury model.
Methods: We performed bilateral pedicle clamping in mice with Swiss background (3-4 months old, 30-40 grams, n=15) for 30 minutes except for control group. Five mice was allocated in each group. Sham operation group (SO, n=5) served as control. Mice were sacrificed in day 1 (IR1, n=5) and day 12 (IR12, n=5) after operation. Lumen area of artery and wall thickness were observed for vascular remodeling. ET-1 and eNOS expression were examined by RT-PCR. We did statistical analysis with ANOVA and *post-hoc* LSD with level of significance p<0,05.
Results: There were significant decrease followed by signifiant increase of lumen area (SO vs IR1 p=0,003; SO vs IR12 p=0,170; IR1 vs IR12 p=0.039) and significant increase followed by significant decrease of wall thickness (SO vs IR1 p=0,076; SO vs IR12 p=0,323; IR1 vs IR12 p=0,012). Endothelin-1 expression was increased significantly then decreased significantly (SO vs IR1 p=0,001; SO vs IR12 p=0,125; IR1 vs IR12 p=0,035). Expression of eNOS was increased then decreased in day 1 and 12 respectively however statistically not significant.
Conclusion: There is vascular remodeling in acute kidney injury contributed by ET-1. Expression of eNOS serves as adaptation to microvascular injury so the damage can be kept at minimal to ensure recovery.
Keywords: acute kidney injury, ischemic reperfusion injury, vascular remodeling, ET-1, eNOS.