

ABSTRACT

BACKGROUND: Chronic kidney disease is now a serious problem in society. Knowledge of the pathogenesis is not fully understood making early detection and treatment are limited. Nitric oxide (NO) is known to have a protective factor against vascular *remodeling*. So we need to know the correlation between endothelial nitric oxide synthase (eNOS) as NO-producing enzyme in blood vessels with vascular *remodeling*.

OBJECTIVES The objective of this study was to observe the expression of eNOS in the state of renal fibrosis as well as observe the correlation between the expression of eNOS in vascular *remodeling*.

METHODS: Subjects were divided into three groups: Sham group (n = 5), UUO7 (n = 5), and UUO14 (n = 5). Sham group received sham surgical treatment while the UUO7 and UUO14 unilateral ureteral obstruction treated (UUO) for 7 days (UUO7) and 14 days (UUO14). Kidney will be taken and made observations eNOS expression by RT-PCR, whereas vascular *remodeling* observed with a microscope and counted using ImageJ software.

RESULTS: Found significantly decreased expression of eNOS in UUO14 compared with SO (p = 0.001). *Remodeling* of blood vessels was observed in the presence of a significant increase in intra-renal artery wall thickness and the ratio of lumen /wall area (p = 0.001). eNOS expression correlation with intra-renal artery wall thickness with a Spearman correlation of -0.619 but not significant (p = 0.102).

CONCLUSION: The expression of eNOS showed negative correlation with vascular *remodeling*, but not statistically significant

KEYWORDS: *Fibrosis, chronic kidney disease, vascular remodeling, eNOS, unilateral ureteral obstruction (UUO)*

INTISARI

LATAR BELAKANG: Penyakit ginjal kronis kini menjadi masalah serius di masyarakat. Pengetahuan tentang patogenesis yang belum sepenuhnya dimengerti membuat deteksi dini dan pengobatan yang terbatas. *Nitric oxide* (NO) diketahui memiliki faktor protektif terhadap *remodeling* pembuluh darah. Sehingga perlu diketahui korelasi antara *endothelial nitric oxide synthase* (eNOS) sebagai enzim penghasil NO di pembuluh darah dengan *remodeling* pembuluh darah.

TUJUAN: Tujuan penelitian ialah mengamati ekspresi eNOS pada keadaan fibrosis ginjal serta mengamati korelasi antara ekspresi eNOS dengan *remodeling* pembuluh darah.

METODE: Subjek penelitian dibagi menjadi tiga kelompok, yaitu kelompok Sham (n=5), UU07 (n=5), dan UU014 (n=5). Kelompok Sham mendapat perlakuan pembedahan sham sedangkan kelompok UU07 dan UU014 mendapat perlakuan *unilateral ureteral obstruction* (UUO) selama 7 hari (UU07) dan 14 hari (UU014). Ginjal akan diambil dan dilakukan pengamatan ekspresi eNOS dengan RT-PCR, sedangkan *remodeling* pembuluh darah diamati dengan mikroskop dan dihitung menggunakan software imageJ.

HASIL: Ditemukan penurunan ekspresi eNOS secara signifikan pada UU014 dibandingkan dengan SO ($p=0,001$). *Remodeling* pembuluh darah diamati dengan adanya peningkatan signifikan pada tebal dinding arteri intra renal dan rasio lumen/area dinding ($p=0,001$). Korelasi ekspresi eNOS dengan tebal dinding arteri intra renal dengan korelasi Spearman sebesar $-0,619$ namun tidak signifikan ($p=0,102$).

KESIMPULAN: Ekspresi eNOS menunjukkan korelasi negatif terhadap *remodeling* pembuluh darah, namun tidak bermakna secara statistik

KATA KUNCI: *Fibrosis, penyakit ginjal kronis, remodeling pembuluh darah, eNOS, unilateral ureteral obstruction (UUO)*