

PENGARUH PEMBERIAN ASAM KLOOROGENAT PADA MENCIT
SWISS WEBSTER DENGAN MODEL
UNILATERAL URETERAL OBSTRUCTION:
Kajian terhadap Kadar Hemoglobin, Fraksi Area Fibrosis,
Ekspresi mRNA TGF- β 1 dan Snail

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INTISARI

Latar belakang: Penyakit ginjal kronis memiliki karakteristik adanya cedera tubulus, inflamasi, dan fibrosis interstitial. Anemia merupakan salah satu komplikasi dari gagal ginjal kronik. *Transforming Growth Factor- β 1* (TGF- β 1) dan Snail berperan penting pada fibrosis ginjal. Asam klorogenat diketahui memiliki efek renoprotektif dan antifibrotik, namun pengaruh asam klorogenat pada, kadar hemoglobin, fraksi area fibrosis, ekspresi mRNA TGF- β 1 dan mRNA Snail masih belum diketahui.

Tujuan: Untuk mengkaji efek pemberian asam klorogenat dalam mencegah fibrosis ginjal pada mencit model *Unilateral Ureteral Obstruction (UUO)*.

Metode: Penelitian ini adalah penelitian kuasi eksperimental dengan rancangan *post test only* dengan subjek 25 ekor mencit galur *Swiss Webster* jantan dewasa yang dibagi dalam 5 kelompok yaitu kelompok SO (*Sham Operation*/kontrol), U7 (UUO hari ke-7), U14 (UUO hari ke-14), UC7 (UUO+asam klorogenat hari ke-7 dengan dosis 14 mg/kgBB/hari secara *intraperitoneal*) dan UC14 (UUO+asam klorogenat hari ke-14 dengan dosis 14 mg/kgBB/hari secara *intraperitoneal*). Kadar haemoglobin diperiksa dengan *hematology analyzer*, fraksi area fibrosis dengan pewarnaan *Sirius Red*. Ekspresi mRNA TGF- β 1 dan mRNA Snail diperiksa dengan RT-PCR. Data yang didapat dikuantifikasi dengan perangkat lunak *ImageJ*, kemudian diolah dengan SPSS.

Hasil: Pada kelompok yang diinduksi UUO tanpa pemberian asam klorogenat menunjukkan kadar hemoglobin yang lebih rendah, fraksi area fibrosis, ekspresi mRNA TGF- β 1 dan Snail yang lebih tinggi dibanding dengan kelompok kontrol dengan nilai $p < 0,005$, sedangkan pada kelompok yang diinduksi UUO dan diberi asam klorogenat menunjukkan kadar hemoglobin yang lebih tinggi, fraksi area fibrosis, ekspresi mRNA TGF- β 1 dan Snail yang lebih rendah dibanding kelompok U14 dengan nilai $p < 0,005$.

Kesimpulan: Pemberian asam klorogenat menunjukkan kadar hemoglobin yang lebih tinggi, fraksi area fibrosis, ekspresi mRNA TGF- β 1 dan mRNA Snail yang lebih rendah dibandingkan kelompok yang tidak mendapat asam klorogenat.

Kata kunci: *Unilateral Ureteral Obstruction (UUO)*, asam klorogenat, kadar hemoglobin, fraksi area fibrosis, TGF- β 1, snail.

THE EFFECT OF CHLOROGENIC ACID ON SWISS WEBSTER MICE WITH UNILATERAL URETERAL OBSTRUCTION MODEL:

Study toward Hemoglobin Level, Fibrosis Area Fraction, TGF- β 1 and Snail mRNA Expression

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ABSTRACT

Backgrounds: Chronic kidney failure cause renal fibrosis that is characterized by tubular injury, inflammation, and interstitial fibrosis. Anemia is one complications of chronic kidney failure. Transforming Growth Factor- β 1 (TGF- β 1) and Snail are important in renal fibrosis. Chlorogenic acid have be known renoprotective and antifibrotic effects, however the effect of chlorogenic acid on hemoglobin level, fibrosis area fraction, TGF- β 1 and Snail mRNA expression were still unknown.

Objective: To assess the effects of chlorogenic acid administration in preventing renal fibrosis in mice with unilateral ureteral obstruction models.

Methods: This was a quasi experimental research with post test only group design. Subjects were 25 of male adult Swiss Webster mice. Subject were divided into 5 group: SO (Sham Operation/control), U7 (day-7), U14 (UUO day-14), UC7 (day-7 UUO+chlorogenic acid with dose 14mg/KgBW/day intraperitoneally) and UC14 (day-14 UUO+chlorogenic acid with dose 14mg/KgBW/day intraperitoneally). Hemoglobin levels have been examined by hematology analyzer, and fibrosis area fractions was examined with Sirius Red staining. TGF- β 1 and Snail mRNA expression have been examined with RT-PCR. The data obtained were quantified with the ImageJ software, then processed with SPSS.

Results: UUO induced group without chlorogenic acid administration showed lower hemoglobin level, higher fibrosis area fraction, TGF- β 1 and Snail mRNA expression compared to control group, $p < 0.005$. Furthermore, chlorogenic acid administration groups had higher hemoglobin level, lower fibrosis area fraction, TGF- β 1 and Snail mRNA expression compared to U14 group, $p < 0.005$.

Conclusion: Chlorogenic acid administration showed higher hemoglobin levels, lower TGF- β 1 and Snail mRNA expression comparison to group without chlorogenic administration.

Key Words: Unilateral Ureteral Obstruction (UUO), Chlorogenic Acid, Hemoglobin Level, Fibrosis Area Fraction, TGF- β 1, Snail.