

INTISARI

EKSPRESI mRNA SDF-1, mRNA IL-6 DAN PARAMETER ANEMIA PADA MODEL MENCIT GAGAL GINJAL NEFREKTOMI 5/6 SUBTOTAL DENGAN PEMBERIAN EKSTRAK ETANOL DAUN YAKON (*Smallanthus sonchifolius*)

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Latar Belakang: Respon inflamasi maladaptif dapat mengakibatkan fibrosis berujung pada gagal ginjal. *Stromal derived factor-1* (SDF-1) dan *interleukin-6* (IL-6) adalah kemokin dan sitokin yang penting dalam aktivasi inflamasi organ ginjal. Peningkatan sitokin berhubungan dengan komplikasi anemia pada gagal ginjal ditandai dengan penurunan ekspresi eritropoetin (EPO), kadar hemoglobin (Hb) dan angka eritrosit (AE). Daun yakon (*Smallanthus sonchifolius*) diketahui memiliki daya antiinflamasi dan efek renoprotektif.

Tujuan: Penelitian ini bertujuan untuk mengkaji ekspresi mRNA SDF-1, mRNA IL-6 dan parameter anemia (nilai AE, kadar Hb, ekspresi EPO) pada mencit model gagal ginjal nefrektomi 5/6 sub total dengan pemberian ekstrak etanol daun yakon dosis bertingkat.

Metode: Dua puluh lima mencit jantan Swiss-Webster usia 3 bulan (30-40g) dibagi dalam 5 kelompok, yaitu kelompok *sham operation* (SO), *subtotal nephrectomy 5/6* (SN), keduanya mendapat *vehicle* (aquadest 0,5ml) dan berturut-turut YK1, YK2, YK3, mendapat ekstrak etanol daun yakon dosis 24,5 mg/kgBB/hari, dosis 49 mg/kgBB/hari, dan dosis 98 mg/kgBB/hari. Perlakuan diberikan selama 14 hari. Ekspresi mRNA SDF-1, IL-6 dan EPO diamati menggunakan *Reverse Transcriptase-PCR*, nilai AE dan kadar Hb diperiksa untuk mengetahui kondisi anemia.

Hasil: Kelompok SO, YK1, YK2 dan YK3 memiliki ekspresi SDF-1 dan IL-6 yang signifikan lebih rendah dibandingkan dengan SN ($p < 0,05$). Ekspresi EPO, kadar Hb dan nilai AE pada kelompok SO lebih tinggi bermakna dibandingkan SN. Nilai AE kelompok YK2 dan YK3 lebih tinggi bermakna dibanding SN, sedangkan kadar Hb lebih tinggi pada YK3 terhadap SN, tetapi hanya YK1 memiliki ekspresi EPO yang signifikan lebih tinggi dibanding SN ($p < 0,05$).

Kesimpulan: Ekspresi mRNA SDF-1, IL-6 pada kelompok mencit model gagal ginjal yang diberi ekstrak etanol daun yakon lebih rendah dibandingkan kelompok mencit gagal ginjal yang tidak diberi ekstrak. Parameter anemia (AE, HB, ekspresi mRNA EPO) mengalami perbaikan pada kelompok mencit gagal ginjal yang diberi ekstrak yakon ditentukan dosis yang diberikan.

Kata Kunci: SDF-1, IL-6, inflamasi, gagal ginjal, anemia, yakon

ABSTRACT

EXPRESSION OF SDF-1 mRNA, IL-6 mRNA AND ANEMIA PARAMETERS ON RENAL FAILURE 5/6 SUBTOTAL NEPHRECTOMY MICE MODEL TREATED WITH YACON LEAVES (*Smallanthus sonchifolius*) ETHANOL EXTRACT

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Background: Maladaptive immune response subsequently followed by fibrosis can cause renal failure (RF). Stromal derived factor-1(SDF-1) and interleukin-6 (IL-6) were chemokine and cytokine that have important role in the activation of inflammation in RF. Furthermore increased of cytokine level also related with anemic condition as common complication in RF marked by decreased of blood erythrocyte count (EC), blood hemoglobin level (Hb) and decreased of erythropoietin (EPO) expression. Yacon leaf (*Smallanthus sonchifolius*) has known for antiinflammatory properties and its effect as renoprotective agent.

Objective: This study aims to determine SDF-1 and IL-6 mRNA expressions and parameters of anemia (EC, Hb and EPO mRNA) in RF mice model subtotal nephrectomy 5/6, treated with staged concentration oral ingestion of yacon leaves (*Smallanthus sonchifolius*) ethanol extract.

Method: Twenty five male Swiss-Webster mice (3 months age, 30-40gram) were divided into 5 groups; SO (sham surgery) and SN (subtotal nephrectomy) group received vehicle only (aquadest 0,5ml), and YK1, YK2 and YK3 groups received oral ingestion of yacon leaf ethanol extract of 24,5 mg/Kg BW/day, 49 mg /Kg BW/day and 98 mg /Kg BW/day consecutively. The treatments were conducted for 14 days and followed with evaluation of SDF-1, IL-6 and EPO expressions using RT-PCR, Hb and EC were measured to determine anemic condition.

Result: SDF-1 and IL-6 expressions in SO, YK1, YK2 and YK3 were significant lower compared to SN group ($p<0,05$). All anemia parameters in SO were higher than SN. However in yacon treatment group compared to SN ($p<0,05$), only YK2 and YK3 showed higher EC, blood hemoglobin level was higher in YK3 whereas EPO expression was higher in YK1 group only ($p<0,05$).

Conclusion: Expression of SDF-1 and IL-6 mRNA were lower in 5/6 subtotal nephrectomy mice model treated with yacon leaf ethanol extract compared to SN group. This results corresponded with the enhancement of anemia parameters (EC, HB and EPO mRNA) in yacon treated group in dose dependent manner.

Keywords: SDF-1, IL-6, inflammation, renal failure, anemia, yacon