

ABSTRAK

Mahardika, Muhammad Vardian. 2013. **HEPAREGS (*Hepar Regenerated by Stem Cells*): Pengembangan Terapi Regeneratif Sebagai Alternatif Transplantasi pada Penyakit Sirosis Hepar dengan Menggunakan Ekstrak Oats (*Avena sativa* L.)**. Tugas akhir, Fakultas Kedokteran Universitas Brawijaya. Pembimbing: dr. Hikmawan Wahyu Sulistomo.

Sirosis hepar adalah inflamasi kronis yang terjadi pada hepar dengan berbagai macam penyebab. Inflamasi yang terus-menerus terjadi akan menyebabkan terbentuknya jaringan fibrous yang akan membunuh sel hepar itu sendiri. Akibatnya hepar tidak berfungsi dengan baik, bahkan hepar akan mati. Penggunaan terapi regeneratif merupakan hal yang potensial untuk dikembangkan. Mengingat pengobatan sampai saat ini yang masih dianggap paling baik yaitu transplantasi, memiliki angka kematian yang cukup tinggi. Pemberian ekstrak oats yang banyak mengandung beta-glucan akan meningkatkan kadar G-CSF dalam tubuh. Peningkatan kadar G-CSF dalam tubuh akan meningkatkan pelepasan hematopoietic stem cells dalam sirkulasi tubuh. Hematopoietic stem cells yang telah dilepaskan akan meregenerasi hepar yang telah rusak. Tujuan penelitian ini untuk mengetahui peran pemberian ekstrak oats dalam mengembalikan struktur anatomis dan fungsi fisiologis dari hepar. Penelitian ini menggunakan desain eksperimen murni (*true experimental design*) di laboratorium secara *in vivo* menggunakan rancangan *randomized post test only controlled group design*. Tikus Wistar diagi menjadi 5 kelompok: Kontrol negatif, Kontrol Positif, dan 3 Perlakuan. Kelompok perlakuan diberikan CCL4 1mg/kgBB secara subcutaneus selama 8 minggu untuk menginduksi kerusakan hepar. Mulai minggu ke-3 hingga ke-8 kelompok perlakuan diberi ekstrak oats dengan dosis: 90, 180, 360 mg/kgBB setiap hari. Hasil penelitian menunjukkan bahwa pemberian ekstrak oats mampu mengembalikan struktur anatomis hepar secara kualitatif. Pemberian ekstrak oats mampu menurunkan kadar SGOT, SGPT, dan bilirubin secara signifikan ($p < 0,05$). Pemberian ekstrak oats juga mampu meningkatkan kadar protein total secara signifikan ($p < 0,05$). Terdapat korelasi yang kuat dan signifikan ($p < 0,01$) antara pemberian ekstrak oats dengan penurunan kadar SGOT ($R = -0,879$), kadar SGPT ($R = -0,861$), kadar bilirubin ($R = -0,675$) dan peningkatan kadar protein total ($R = 0,746$). Kesimpulan dari penelitian ini yaitu ekstrak oats mampu mengembalikan struktur anatomis dan fungsi fisiologis dari hepar yang telah mengalami sirosis melalui mobilisasi *hematopoietic stem cells* dari sumsum tulang secara *in vivo*.

Kata kunci : *Avena sativa* L., Sirosis hepar, SGOT, SGPT, Bilirubin total, Protein total

ABSTRACT

Mahardika, Muhammad Vardian. 2013. **REGENERATIVE THERAPY INNOVATION FOR LIVER CIRRHOSIS BY MOBILIZATION OF HEMATOPOIETIC STEM CELLS AS AN ALTERNATIVE FOR TRANSPLANTATION BY OATS (*Avena sativa* L.)** Final Assignment, Faculty of Medicine University of Brawijaya. Supervisor: dr. Hikmawan Wahyu Sulistomo.

Liver cirrhosis is a chronic inflammation that involves many factors. The continuous result of inflammation is associated with dying liver cells that causes fibrous tissues to form. As a result, the liver is not functioning properly, and eventually liver will die. Liver Transplantation as the best therapy now still has a high failure rate. Regenerative therapy is a potential therapy to be developed. Oats contains beta-glucan that can increase the level of G-CSF (Granulocyte Colony Stimulating Factor) in the body. Elevated levels of G-CSF would increase the release of hematopoietic stem cells into the body circulation. Hematopoietic stem cells will be mobilized into the liver and regenerate liver cells that have been damaged. The purpose of this study is to determine the effects of oats in restoring anatomical structures and physiological functions of the liver cirrhosis. This study is true experimental research with posttest only controlled group design. 20 wistar male rats as experimental animals were divided into 5 groups: negative control, positive control, Treatment 1 (CCL4+Oats extraction 90mg/kgBB), Treatment 2 (CCL4+Oats extraction 180mg/kgBB), treatment 3 (CCL4+Oats extraction 360mg/kgBB). CCl₄ to induce hepatic damage was injected 1 ml/kg body weight for 8 weeks in subcutaneous. Oats are given daily from week 3 to week 8. The results showed that administration of oats is able to restore the anatomical structure of the liver qualitatively. Oats could reduce the levels of SGOT, SGPT, and bilirubin significantly ($p < 0,05$). Oats are able to increase the total protein levels significantly ($p < 0,05$) and levels of CD34⁺ as a marker of stem cells mobilization. There is a strong and significant correlation between the provision of oats with reduced levels of SGOT levels $R = -0,879$, SGPT levels ($R = -0,861$), bilirubin levels ($R = -0,675$) and elevated levels of total protein total ($R = 0,746$), CD34⁺. Conclusion of this study shows that oats can increase the mobilization of hematopoietic stem cells to regenerate liver cirrhosis, indicated by the return of anatomical structures and physiological functions of the liver (decreased levels of SGOT, SGPT, total bilirubin, and increased levels of total protein and CD34⁺ in vivo). Thus, oats can become a regenerative therapy innovation for liver cirrhosis by mobilization of hematopoietic stem cells as an alternative for liver transplantation

Key word : Oats, Liver Cirrhosis, Transplantation, SGOT, SGPT, Bilirubin total, Protein total