

## INTISARI

**Latar Belakang :** Hemodialisis (HD) adalah terapi pengganti ginjal yang banyak dijalani oleh pasien penyakit ginjal kronis (PGK) tahap akhir. Pasien HD mengalami penurunan kadar antioksidan darah dikarenakan malnutrisi, pembatasan konsumsi sayuran dan buah, serta kehilangan vitamin terlarut dalam air akibat tindakan HD. Penyebab utama kematian pada populasi ini adalah penyakit kardiovaskular/*cardiovascular disease* (CVD). Faktor risiko CVD pada PGK adalah dislipidemia dan stress oksidatif. Zat antioksidan menurunkan kondisi stress oksidatif, mempengaruhi ekspresi gen, aktivitas PON1 serta metabolisme lipid melalui beberapa cara. Asam askorbat adalah antioksidan yang poten, sederhana serta mudah didapatkan. Penelitian sebelumnya menunjukkan hasil yang tidak konsisten sehingga penelitian ini kami lakukan.

**Tujuan Penelitian:** Mengetahui pengaruh suplementasi asam askorbat 500 mg intravena di akhir setiap sesi HD dua kali seminggu selama 12 minggu terhadap aktivitas enzim PON 1 serta kadar LDL, HDL, trigliserida dan total kolesterol pada pasien HD rutin.

**Metode Penelitian:** Penelitian eksperimen-kuasi, pra-paska perlakuan dengan kelompok kontrol pada pasien HD rutin dua kali seminggu berusia >18 tahun. Subyek dibagi menjadi dua kelompok yaitu kelompok perlakuan mendapatkan 500 mg asam askorbat intravena di akhir sesi HD dua kali seminggu, sedangkan kelompok kontrol mendapatkan terapi plasebo. Kedua kelompok diamati 12 minggu. Dilakukan analisis terhadap perbedaan kadar aktivitas enzim PON 1, LDL, HDL, trigliserida dan total kolesterol, sebelum dan sesudah perlakuan.

**Hasil:** Hasil analisis pada kelompok perlakuan menunjukkan kenaikan rasio LDL/HDL ( $p=0,011$ ), kenaikan aktivitas enzim PON 1 ( $p<0,001$ ), penurunan kadar trigliserida ( $p=0,394$ ), sedangkan hasil analisis kelompok kontrol menunjukkan peningkatan kadar LDL ( $p=0,036$ ), penurunan kadar HDL ( $p=0,024$ ), kenaikan aktivitas enzim PON 1 ( $p<0,001$ ), dan peningkatan kadar trigliserida ( $p=0,296$ ). Tidak didapatkan perbedaan bermakna pada peningkatan aktivitas enzim PON 1, perubahan kadar LDL, HDL, trigliserida, dan kolesterol total ( $p>0,05$ ) pada kelompok perlakuan dibandingkan kontrol.

**Simpulan:** Suplementasi 500 mg asam askorbat intravena di akhir sesi hemodialisis dua kali seminggu selama 12 minggu pada kelompok perlakuan mengakibatkan perbedaan bermakna terhadap peningkatan aktivitas enzim PON 1 dan rasio LDL/HDL, akan tetapi bila dibandingkan dengan kelompok kontrol maka tidak didapatkan perbedaan yang bermakna pada peningkatan aktivitas enzim PON 1, perubahan kadar LDL, HDL, trigliserida maupun kolesterol total.

**Kata Kunci:** Hemodialisis, Asam Askorbat, Aktivitas Enzim Paraoksonase 1, Kolesterol Total, LDL, HDL, Trigliserida.

## ABSTRACT

**Background:** Hemodialysis (HD) is a renal replacement therapy which is used by end-stage renal disease (ESRD) patients. Hemodialysis patients suffered from low blood antioxidant levels due to malnutrition, restrictions on vegetable and fruit consumption, and loss of water-soluble vitamins due to HD. The main cause of death in this population is cardiovascular disease (CVD). Risk factors for CVD in ESRD are dyslipidemia and oxidative stress. Antioxidants reduce oxidative stress, affect gene expression, PON1 activity and lipid metabolism through several ways. Ascorbic acid is a potent, simple and easily obtained antioxidant. Previous studies have shown inconsistent results, so we conducted this study.

**Objective:** To determine the effect of 500 mg intravenous ascorbic acid supplementation at the end of each HD session twice a week for 12 weeks on PON 1 activity level, LDL, HDL, triglyceride and total cholesterol levels in maintenance HD patients.

**Methods:** Quasi-experimental study, pre-post treatment with a control group in maintenance HD patients twice a week aged >18 years. Subjects were divided into two groups, namely the treatment group that received 500 mg intravenous ascorbic acid at the end of the HD session twice a week, while the control group received placebo therapy. Both groups were observed for 12 weeks. Analysis was carried out on the differences of PON 1 enzyme activity levels, LDL, HDL, triglyceride and total cholesterol before and after treatment.

**Results:** Statistical analysis results in the treatment group showed an increase in LDL/HDL ratio ( $p=0.011$ ), an increase in PON 1 enzyme activity ( $p<0.001$ ), a decrease in triglyceride levels ( $p=0.394$ ), while the results of the control group analysis showed an increase in LDL ( $p=0.036$ ), a decrease in HDL ( $p=0.024$ ), an increase in PON 1 enzyme activity ( $p<0.001$ ), and an increase in triglyceride levels ( $p=0.296$ ). There was no significant difference in the increase of PON 1 enzyme activity, changes in LDL, HDL, triglyceride, and total cholesterol levels ( $p>0.05$ ) in the treatment group compared to the control group.

**Conclusion:** Intravenous supplementation of 500 mg ascorbic acid at the end of twice-weekly hemodialysis sessions for 12 weeks in the treatment group cause significant increase in PON 1 enzyme activity and LDL/HDL ratio, however, when compared with the control group, there were no significant differences in changes of PON 1 enzyme activity, LDL, HDL, triglyceride or total cholesterol levels.

**Keywords:** Hemodialysis, Ascorbic Acid, Paraoksonase 1 activity level, Total Cholesterol, LDL, HDL, Triglycerides.