

# Aktivitas glutathione peroksidase dan konsentrasi MMP-9 setelah olahraga aerobik intensitas sedang selama 12 minggu pada perempuan lansia sedenter = Glutathione peroxidase activity and MMP-9 concentration after 12 weeks of moderate aerobic exercise in sedentary elder women / Rininta

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## Abstrak

### <b>ABSTRAK</b><br>

Latar belakang: Lansia sedenter memiliki konsentrasi ROS yang lebih tinggi dan aktivitas antioksidan yang lebih rendah dibanding lansia yang aktif. ROS telah banyak dikaitkan dengan peningkatan ekspresi MMP-9 melalui aktivasi faktor transkripsi seperti AP-1 dan NF $\kappa$ B. Konsentrasi MMP-9 yang meningkat akibat peningkatan ekspresi gen, memiliki korelasi erat dengan berbagai penyakit degeneratif pada lansia. Olahraga rutin dapat meningkatkan aktivitas antioksidan, sehingga akhirnya diharapkan konsentrasi MMP-9 akan menurun. Penelitian ini bertujuan untuk menilai efek olahraga aerobik intensitas sedang selama 12 minggu terhadap aktivitas glutathione peroksidase GPX dan konsentrasi MMP-9 lansia. Metode: Sampel penelitian bahan biologis tersimpan berupa plasma darah. Subjek perempuan lansia sedenter yang dibagi ke dalam kelompok kontrol n=22 dan kelompok perlakuan n=22. Olahraga aerobik berjalan kaki selama 30 menit tiap sesi, tiga kali seminggu, selama 12 minggu. Aktivitas GPX diperiksa dengan metode spektrofotometri dan konsentrasi MMP-9 dengan ELISA dari plasma minggu 0 dan minggu 12. Hasil: Pada minggu 12 terdapat penurunan aktivitas GPX tidak signifikan pada kelompok kontrol p=0,285 dan peningkatan signifikan pada kelompok perlakuan p=0,00. Konsentrasi MMP-9 minggu 12 menurun pada kelompok perlakuan p=0,024 dan meningkat pada kelompok kontrol p=0,08. Kesimpulan: Olahraga aerobik intensitas sedang selama 12 minggu dapat meningkatkan aktivitas GPX dan menurunkan konsentrasi MMP-9 pada lansia sedenter. Kata kunci: perempuan lansia sedenter, aktivitas GPX, konsentrasi MMP-9, olahraga intensitas sedang

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### <b>ABSTRACT</b><br>

Background and Aims Sedentary elder have higher level of ROS and lower antioxidant activity. ROS is implicated in the increase of MMP 9 gene expression by activating several transcription factor, namely AP 1 and NF B. Higher concentration of MMP 9 is positively correlated with many degenerative diseases seen in elderly. Routine exercise can increase antioxidant activity. This study aims to analyse the effects of 12 week moderate intensity aerobic exercise on sedentary elderly women rsquo s glutathione peroxidase GPX activity and MMP 9 plasma level. Methods Samples were plasma from subject rsquo s peripheral blood which was obtained from the previous study and have been stored in 80 oC freezer. Subjects were sedentary elder women control group n 22, exercise group n 22 with no prior comorbidities. Exercise group performed a 12 week walking program, 30 minutes session, 3x week. GPX activity was measured by spectrophotometry and MMP 9 plasma level by ELISA. Parameters measurement was performed to week 0 dan week 12 plasma. Results Control group GPX activity in week 12 was non significantly lower p 0,285. Meanwhile exercise group GPX activity in week 12 was significantly elevated in exercise group p 0,00. MMP 9 plasma level in week 12 was lower for exercise group p 0,024, but higher for control group p 0,08

.Conclusions Moderate intensity aerobic exercise elevates GPX activity and lowers MMP 9 plasma level in previously sedentary elder women. This changings could be important to attenuate the progressive nature of various organes fibrosis due to ageing process.Keywords sedentery elder women, GPX activity, MMP 9 concentration, moderate exercise