

PENGARUH PEMBERIAN EKSTRAK PERICARP GARCINIA MANGOSTANA LINN DAN LATIHAN FISIK TERHADAP PERBAIKAN GAMBARAN HISTOPATOLOGI VASKULER PARU TIKUS WISTAR DENGAN SINDROM METABOLIK

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ABSTRAK

Latar belakang : Sindrom metabolik, dengan prevalensi global yang signifikan, menjadi masalah utama kesehatan. Sindrom ini dapat menyebabkan aterosklerosis pembuluh darah paru, meningkatkan hipertensi pulmonal, dan risiko penyakit kardiovaskular. Obesitas dan faktor lingkungan berperan sebagai faktor risiko utama sindrom ini.

Tujuan : Penelitian ini bertujuan menginvestigasi histopatologi aterosklerosis vaskuler paru pada sindrom metabolik serta mengevaluasi efek terapeutik kombinasi atorvastatin, ekstrak pericarp *Garcinia mangostana* Linn, dan MG-loaded self-microemulsion dengan latihan fisik pada tikus Wistar yang diinduksi diet tinggi lemak

Metode : Melibatkan pemeliharaan, perlakuan, dan pemeriksaan pre-test di Integrated Biomedic Laboratory (IBL) UNISULLA. Tikus Wistar jantan diinduksi diet tinggi lemak, dipilih secara acak sederhana. Data dikumpulkan melalui berbagai alat dan bahan, dengan analisis menggunakan uji beda mean, pre-test, dan post-test.

Hasil : Penelitian menunjukkan aterosklerosis pada pembuluh darah paru tikus Wistar yang diinduksi diet tinggi lemak. Pemberian atorvastatin, ekstrak pericarp *Garcinia mangostana* Linn, dan MG-loaded self-microemulsion, disertai latihan fisik, signifikan mempengaruhi perbaikan histopatologi vaskuler paru. Efek positif terlihat pada setiap terapi yang dikombinasikan dengan latihan fisik, menunjukkan perbedaan signifikan dalam perbaikan gambaran histopatologi vaskuler paru.

Kesimpulan : Pada sindrom metabolik, kombinasi terapi atorvastatin, ekstrak pericarp *Garcinia mangostana* Linn, dan MG-loaded self-microemulsion dengan latihan fisik memberikan dampak positif pada perbaikan histopatologi vaskuler paru pada tikus Wistar diinduksi diet tinggi lemak.

Kata Kunci : Sindrom metabolik, aterosklerosis vaskuler paru, terapi kombinasi.

EFFECT OF GARCINIA MANGOSTANA LINN PERICARP EXTRACT AND PHYSICAL EXERCISE ON THE IMPROVEMENT OF PULMONARY VASCULAR HISTOPATHOLOGY OF WISTAR RATS WITH METABOLIC SYNDROME

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ABSTRACT

Background: Metabolic syndrome, with a significant global prevalence, is becoming a major health concern. It can lead to pulmonary vascular atherosclerosis, increased pulmonary hypertension and cardiovascular disease risk. Obesity and environmental factors act as major risk factors for this syndrome.

Objective: This study aims to investigate the histopathology of pulmonary vascular atherosclerosis in metabolic syndrome and evaluate the therapeutic effects of a combination of atorvastatin, *Garcinia mangostana* Linn pericarp extract, and MG-loaded self-microemulsion with physical exercise in high-fat diet-induced Wistar rats.

Methods: Involved maintenance, treatment, and pre-test examination at the Integrated Biomedical Laboratory (IBL) of UNISULLA. Male Wistar rats were induced with high-fat diet, selected by simple randomization. Data were collected through various tools and materials, with analysis using t-test of mean, pre-test, and post-test.

Results: The study showed atherosclerosis in pulmonary blood vessels of Wistar rats induced by high-fat diet. Administration of atorvastatin, *Garcinia mangostana* Linn pericarp extract, and MG-loaded self-microemulsion, accompanied by physical exercise, significantly affected the improvement of pulmonary vascular histopathology. Positive effects were seen in each therapy combined with physical exercise, showing significant differences in the improvement of pulmonary vascular histopathology.

Conclusion: In metabolic syndrome, combination therapy of atorvastatin, *Garcinia mangostana* Linn pericarp extract, and MG-loaded self-microemulsion with physical exercise has a positive impact on the improvement of pulmonary vascular histopathology in Wistar rats induced by high-fat diet.

Keywords: Metabolic syndrome, pulmonary vascular atherosclerosis, combination therapy.