

**ABSTRAK**

**Efek Latihan Fisik Intensitas Sedang Terhadap Diameter Serabut Otot Gastrocnemius *Mus Musculus* yang Mendapat Pajanan Statin**

**Junita Jeanne Paliman, Ratna Darjanti Haryadi, Noor Idha Handajani**

**Latar belakang:** Dislipidemia didefinisikan kelainan metabolisme lipid ditandai peningkatan maupun penurunan fraksi lipid dalam plasma. Statin merupakan obat dislipidemia. Paparan statin memicu apoptosis. Statin mengaktivasi protein FOXO (forkhead box class-O) yang menginduksi atrogin-1, gen penyebab degradasi protein dan atrofi otot. Latihan fisik intensitas sedang yang berulang dapat merangsang biogenesis mitokondria dan meningkatkan transkripsi koaktivator peroksisom lalu menekan FOXO sehingga mencegah atrofi otot.

**Tujuan:** membandingkan diameter serabut otot gastrocnemius *Mus musculus* antara kelompok yang diberikan statin, kelompok yang diberikan statin dan treadmill dan kelompok kontrol.

**Materi dan Metode :** Tiga puluh ekor mencit putih (*Mus musculus* galur BALB/C) dibagi menjadi 3 kelompok: kelompok pertama mendapatkan statin (S), kelompok kedua mendapatkan statin dan latihan fisik intensitas sedang menggunakan motorized treadmill, derajat inklinasi 5% (ST) dan kelompok kontrol (K) semua perlakuan selama 28 hari. Dosis statin digunakan 2,06mg/kgBB. Diameter diukur pada pemeriksaan Histopatologi dengan pewarnaan HE.

**Hasil :** Diameter serabut otot gastrocnemius *Mus musculus* tidak terdapat perbedaan bermakna antara kelompok S dibandingkan kelompok K ( $p= 0,076$ ), kelompok ST dibandingkan dengan kelompok K ( $p=0,881$ ) dan kelompok S dibandingkan kelompok ST ( $p=0,212$ ). Diameter serabut otot kelompok S lebih kecil dibandingkan dengan diameter kelompok ST dan diameter kelompok K.

**Kesimpulan :** Hasil penelitian ini menunjukkan efek latihan fisik intensitas sedang selama empat minggu tidak dapat meningkatkan diameter otot.

**Kata kunci :** diameter serabut otot, dislipidemia, latihan fisik intensitas sedang, statin

**ABSTRACT**

**Moderate Intensity Physical Exercise Effects on Gastrocnemius Muscle Fibers Diameter of Mus Musculus with Statin Treatment**

**Junita Jeanne Paliman, Ratna Darjanti Haryadi, Noor Idha Handajani**

**Background:** Dyslipidemia is defined as abnormality of plasma lipids. Statins are dyslipidemia drugs. Statins can induce apoptosis in skeletal muscle. Statins activate FOXO proteins (forkhead box class-O) that induce the formation of atrogen-1, a gene that causes protein degradation and muscle atrophy. Repeated exercise of moderate intensity can stimulate mitochondrial biogenesis and increase coactivator peroxisome transcription which can suppress FOXO so that it can prevent muscle atrophy.

**Objective:** to compare gastrocnemius Mus musculus muscle fibers diameter between of the group given statin treatment, the group given statin treatment plus treadmill and control group.

**Materials and Methods:** Thirty mice (Mus musculus BALB/C strain) were divided into 3 groups: first group received statin treatment (S), second group received statin treatment plus moderate intensity physical exercise using motorized treadmill with frequency 3 times a week all on 5% inclination for 28 days (ST), and control group (C). Dose of atorvastatin 2,06mg/bw. Measurement diameter was done by histopathology evaluation.

**Results:** There were not significantly differences of diameter in the S group than C group, ( $p=0,076$ ), the ST group than C group ( $p= 0,881$ ), as well as S group and the ST group ( $p=0,212$ ). Muscle fibers diameter of S group smaller than ST group and C group.

**Conclusion:** Moderate intensity physical exercise for four weeks cannot increase diameter of muscles.

**Keywords:** moderate intensity physical exercise, muscle fiber diameter, statins