Efek Latihan *Treadmill* Intensitas Sedang dengan Peningkatan Kecepatan dan Inklinasi Bertahap terhadap IL-6 Serum penderita Diabetes Melitus tipe 2 Laki-Laki

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ABSTRAK

Objektif: Belum ada rekomendasi mengenai tipe latihan aerobik dalam menurunkan proses inflamasi sistemik pada penderita DM tipe 2. Tujuan dari penelitian ini adalah melihat efek latihan *treadmill* intensitas sedang selama 30 menit dengan peningkatan kecepatan dan inklinasi terhadap pasien DM tipe 2 laki-laki dalam menurunkan keadaan inflamasi kronis derajat rendah.
Metode: Penelitian acak dua kelompok dilakukan antara Juli 2019 hingga September 2019. Sepuluh pasien laki-laki DM tipe 2 (usia 30-55 tahun) tanpa komplikasi, dengan gula darah terkontol dari Poli Endokrin Ilmu Penyakit Dalam Rsud dr. Soetomo, direkrut dan dialokasikan secara acak ke dalam dua kelompok. Pada kelompok perlakuan, setiap pasien mendapat latihan *treadmill* intensitas sedang dengan peningkatan kecepatan dan inklinasi. Latihan dilakukan selama 30 menit selama 4 minggu, 2-3 kali perminggu. Pada kelompok kontrol, setiap pasien mendapat pengobatan standar beserta edukasi aktivitas fisik selama 150 menit perminggu. Pengukuran kadar IL-6 serum dilakukan hari pertama dan terakhir. Pada kelompok perlakuan dilakukan pengukuran kadar IL-6 serum 30 menit setelah latihan aerobik.
Hasil: Pada kelompok perlakuan, kadar IL-6 serum menurun tidak signifikan dari 13,73±10,20 pg/ml menjadi 7,70±9,99 pg/ml (p=0,203). Kelompok kontrol menunjukkan trend peningkatan kadar IL-6 tidak signifikan dari 6,46±7,56 pg/ml menjadi 8,43±11,15 mg/ml (p=0,484). Latihan *treadmill* intensitas sedang secara signifikan meningkatkan kadar serum IL-6 puncak pada hari pertama latihan yaitu 13,73±10,20 menjadi 28,48±19,64 pg/ml (p=0,003) dan hari terakhir latihan yaitu 7,70±9,99 menjadi 36,47±37,30 pg/ml (p=0,009).
Kesimpulan: Studi ini menunjukkan bahwa latihan aerobik selama 4 minggu tidak menurunkan IL-6 basal pada pasien DM tipe 2. Latihan meningkatkan kadar serum IL-6 puncak 30 menit segera setelah latihan.

Kata Kunci: latihan *treadmill,* intensitas sedang, peningkatan kecepatan dan inklinasi, DM tipe 2, interleukin-6 (IL-6)

Effects of Treadmill Exercise Moderate Intensity with Increasing Speed and Inclination of IL-6 Serum with Type 2 Diabetes Mellitus Male Patients

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ABSTRACT

Objective: There are no recommendations regarding the type of aerobic exercise in reducing systemic inflammatory processes in patients with type 2 diabetes. The aim of this study is to look at the effect of moderate-intensity treadmill exercise for 30 minutes with an increase in speed and inclination of male with type 2 diabetes patients in reducing the chronic low-grade inflammation.

Method: A randomized two-group study was carried out between July 2019 and September 2019. Ten male patients with type 2 diabetes (30-55 years old) without complications, with blood sugar controlled from Endocrine Polyclinic Internal Medicine RSUD dr. Soetomo, was recruited and allocated randomly into two groups. In the treatment group, each patient received moderate intensity treadmill training with increased speed and inclination. The exercise is carried out for 30 minutes for 4 weeks, 2-3 times a week. In the control group, each patient received standard treatment along with physical activity education for 150 minutes a week. Measurement of serum IL-6 levels was done on the first and last day. In the treatment group, serum IL-6 levels were measured 30 minutes after aerobic exercise.

Results: In the treatment group, serum IL-6 levels decreased insignificantly from 13.73 ± 10.20 pg / ml to 7.70 ± 9.99 pg / ml (p = 0.203). The control group showed no significant trend of increasing IL-6 levels from 6.46 ± 7.56 pg / ml to 8.43 ± 11.15 mg / ml (p = 0.484). Moderate treadmill exercise significantly increased peak serum IL-6 levels on the first day of exercise, 13.73 ± 10.20 to 28.48 ± 19.64 pg / ml (p = 0.003) and the last day of exercise was 7.70 ± 9.99 to 36.47 ± 37.30 pg / ml (p = 0.009).

Conclusions: This study shows that aerobic exercise for 4 weeks does not reduce basal IL-6 in type 2 DM patients. Exercise increases peak serum IL-6 levels 30 minutes immediately after exercise.

Key Words: treadmill exercise, moderate intensity, increased speed and inclination, DM type 2, interleukin-6 (IL-6)