

**EFEK LATIHAN *TREADMILL* INTENSITAS SEDANG DENGAN
PENINGKATAN KECEPATAN DAN INKLINASI BERTAHAP TERHADAP
TNF- α SERUM PENDERITA DIABETES MELLITUS TIPE 2 LAKI-LAKI**

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Abstrak

Objektif: Penderita diabetes mellitus tipe 2 mengalami inflamasi sistemik kronis. Latihan aerobik terbukti dapat mengurangi inflamasi sistemik. Tujuan dari penelitian ini adalah mengetahui efek latihan *treadmill* intensitas sedang dengan peningkatan kecepatan dan inklinasi bertahap terhadap kadar TNF- α serum pada penderita DM tipe 2 laki-laki.

Metode: Dua puluh dua pasien DM tipe 2 laki-laki yang terkontrol direkrut. Usia subyek penelitian adalah 35-55 tahun dengan indeks massa tubuh 18,5-28,5 kg/m². Subyek dibagi menjadi dua kelompok; kelompok perlakuan yang mendapatkan latihan *treadmill* intensitas sedang (65-75% HR maks) dengan peningkatan kecepatan dan inklinasi bertahap selama 30 menit, 3 kali per minggu, selama 4 minggu, dan kelompok kontrol yang tidak mendapatkan latihan selama 4 minggu. Kadar TNF- α serum diukur sebelum dan setelah perlakuan pada kedua kelompok.

Hasil: Terdapat penurunan kadar TNF- α serum secara bermakna pada kelompok yang diberi latihan *treadmill* dari 14,67 \pm 8,32 menjadi 11,28 \pm 7,28 (p=0,017). Pada kelompok kontrol tidak terdapat perubahan kadar TNF- α serum yang bermakna dari 8,25 \pm 3,4 menjadi 9,03 \pm 5,07 (p=0,537). Tidak didapatkan perbedaan bermakna antara selisih rerata penurunan TNF- α serum antara kelompok perlakuan dan kontrol pada akhir penelitian (-3,39 \pm 3,91 vs 0,96 \pm 5,01; p=0,220).

Kesimpulan: Latihan *treadmill* intensitas sedang dengan peningkatan kecepatan dan inklinasi bertahap selama 4 minggu dapat menurunkan kadar TNF- α serum penderita DM tipe 2 laki-laki.

Kata kunci: latihan aerobik, intensitas sedang, *treadmill*, TNF- α serum, DM tipe 2.

EFFECT OF MODERATE INTENSITY TREADMILL EXERCISE WITH GRADUAL INCREASED SPEED AND INCLINATION ON TNF- α SERUM IN TYPE 2 DIABETES MELLITUS MALE PATIENTS

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Abstract

Objective: Type 2 diabetes mellitus patients frequently suffer from low-grade, chronic systemic inflammation. Moderate intensity aerobic exercise was proved to modulate systemic inflammation. This study was an attempt to measure the impact of moderate intensity treadmill exercise with gradual increase in speed and inclination on TNF- α serum in type 2 diabetes mellitus male patients.

Methods: Twenty-two male patients with type 2 diabetes mellitus participated in the present study, their age ranged from 35-55 years, and their body mass index ranged from 18,5-28,5 kg/m². These subjects were assigned to two subgroups; Training group that received moderate intensity (65-75% HRmax) treadmill exercise with gradual increase in speed and inclination for 30 minutes, 3 times a week, for four weeks; and control group that received no exercise for four weeks. Measurement of TNF- α serum was assessed before and at the end of the study for all participants in both groups.

Results: The mean value of TNF- α was significantly decreased in training group from 14.67 \pm 8.32 to 11.28 \pm 7.28 (p=0.017), while the changes mean value of TNF- α was not significant in control group from 8.25 \pm 3.4 to 9.03 \pm 5.07 (p=0.537). There was no significant difference between mean value of TNF- α in training group and control group at the end of the study (-3,39 \pm 3,91 vs 0,96 \pm 5,01; p=0,220).

Conclusion: moderate intensity treadmill exercise with gradual increase in speed and inclination can improve TNF- α serum in type 2 diabetes mellitus male patients.

Keywords: Aerobic exercise, moderate intensity, treadmill, TNF- α serum, type 2 diabetes mellitus.