# Pengaruh Terapi Latihan Penguatan Otot Kuadrisep Intensitas Ringan dan Sedang pada Penderita Osteoarthritis Lutut Tinjauan terhadap Kekuatan otot Kuadrisep, Waktu Jalan 15 meter dan Kadar Enzim Kreatin Kinase Serum = Effect Quadriceps Muscle Strengthening Low and Moderate Intensity In Patient With Osteoarthritis Knee Study of Quadriceps Muscle Strength, Confortable Walking Speed 15 meters, and Creatine Kinase Enzyme

Azka Hayati, author



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Abstrak

Latar Belakang : Otot Kuadrisep pada penderita Osteoarthritis lutut disekitar sendi lutut sering mengalami atrofi, penurunan kekuatan serta fungsi sebagai stabilitas sendi terutama sendi penumpu berat badan. Terapi latihan merupakan salah satu bentuk rehabilitasi untuk peningkatan kekuatan otot sekitar sendi, yang mengalami kelemahan karena nyeri dan tidak digunakan. Volume latihan yang tinggi dapat menyebabkan kerusakan struktural otot skeletal. Secara struktural latihan yang menyebabkan kelemahan sarkomer akibat dari robeknya membran dan rendahnya kadar protein intraseluler (Kreatin Kinase) karena masuk ke dalam aliran darah. Semakin tinggi intensitas latihan penguatan otot semakin tinggi pula terjadinya risiko kerusakan otot, akan tetapi semakin rendah intensitas penguatan otot semakin kurang efektivitas pencapaian penguatan otot.

Tujuan : Untuk mengetahui efektivitas latihan penguatan otot intensitas rendah dan sedang untuk mencapai kekuatan otot Kuadrisep dan fungsi yang optimal pada penderita OA lutut serta tidak menyebabkan kerusakan otot yang bermakna.

Populasi dan Sampel : Semua pasien OA lutut usia 50-65 tahun di poliklinik Muskuloskeletal Departemen Rehabilitasi Medik RSCM dengan nyeri lutut VAS < 4 dan klinis (kriteria ACR) serta memenuhi kriteria penerimaan.

Metode : Dilakukan pengukuran kekuatan otot Kuadrisep dengan dinamometer jinjing, kecepatan jalan 15 meter (detik), dan kadar serum enzim Kreatin Kinase sebelum dan setelah latihan. Responden dibagi menjadi 2 kelompok intensitas ringan (40% dari 10 RM) dan sedang (60% dari 10 RM) dilakukan latihan penguatan otot Kuadrisep isotonik dengan menggunakan NK table 3 set 10 repetisi, frekuensi 3 x/minggu selama 8 minggu dengan kenaikan beban bertahap setiap minggu.

Hasil : Terdapat perbedaaan bermakna peningkatan sebesar 27,2 % kekuatan otot Kuadrisep setelah diberikan latihan intensitas ringan (p=0,001) dan sebesar 27,94 % (p <0,001) latihan intensitas sedang. Didapatkan penurunan waktu jalan 15 meter sebesar 39,9 % pada intensitas ringan (p=0,03) dan penurunan sebesar 47,37% pada intensitas sedang (p=0,007). Kedua kelompok tidak menunjukkan perbedaan bermakna pada kekuatan otot, kecepatan jalan, dan kadar enzim Kreatin Kinase.

Kesimpulan : Latihan kekuatan otot Kuadrisep intensitas ringan dan sedang efektif mencapai kekuatan otot dan fungsi yang optimal tanpa menyebabkan kerusakan otot yang bermakna.

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Background : Osteoarthritits is rheumatoid disease mostly occurs in knee joint. Quadricep muscle around joint frequently athrophy, reduce strengthening, and functioning as stability joint especially as a role weight

bearing joint so that occur deformity and worsen disease. Therapeutic exercise is one of rehabilitation treatment to enhance muscle strengthening around joint that become weakness due to pain and inactivity. Therefore it is important to make exersie prescription to achieve optimal result. High intensity exercise may cause structural damage skeletal muscle. This damage may lead muscle soarness, edema, and weakness. In structural, exercise can lead frailty of sarcomer consequence disruption of membrane and reduction level of protein intraceluller (Creatine Kinase) into bloodstream. Higher intensity of exercise will cause high risk of injury, however lower of intensity of muscle strengthening increasing less effective achievement of muscle strength. Ideally training given to the patient is an effective muscle-strengthening exercises to achieve optimal muscle strength and functional improvement achieved in the absence of muscle damage.
Objective : to find effetctivity of strengthening exercises low and moderate intensity to achieve Quadriceps muscle strength and optimal functional in patient with knee OA without causes significantly muscle damage.

Subject : All of knee OA patient at Inpatient of Musculoskeletal Rehabilitation Departement-Medical Faculty of Indonesia - Cipto Mangunkusumo Hospital, age 50-65 years with knee pain VAS < 4, clinical according American College of Rheumatology, and require inclusion criteria.
Method : Pre and Post Experimental, measurement of Quadriceps muscle strengthening with Hand held Dynamometer before and after exercise, time of walking speed on 15 metre (second), and creatine Kinase enzyme in blood serum. Subject divide to be 2 group, low intensuty (40% of 10 RM) and moderate (60% of 10 RM). Isotonic Quadricep strengthening exercise with NK table, 3 set 10 repetion 3 times in week during 8 week that intensity gradually increase each week.
Result : The study found that significantly increase of 27,2 % muscular strength Quadricep that having given a low intensity exercise ( $p = 0,001$ ) and significantly increase of muscular strength 27,94 % ( $p < 0,001$ ) in moderate intensity exercise . Decline significantly time of walking speed on 15 meters of 39,9 % in group low intensity ($p = 0.03$) and 47,37 % in moderate intensity ($p = 0,007$). Both of groups did not show the difference activity of Creatine Kinase.This study indicated no difference significantly exercise of muscular strengthen in both groups low and moderate intensity ($p = 0,410$ ).There was not significantly difference time walking speed both of group ($p = 0,514$). There were no significantly differences levels of enzyme Creatine kinase in both groups.
Conclusion: Quadriceps muscle exercise low and moderate intensity effective achieve muscle’s strength and functional optimal without causes significantly muscle damage.