

筋電計を用いて測定する下肢の筋活動から見た 健康増進のための効果的な運動法の検討

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An Investigation About the Effective Exercise Methods for Health Promotion Through the Measurement of Lower Limb Muscle Activities with EMG (Electromyography)

by

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ABSTRACT

Walking is widely conducted among people as an exercise for health promotion. In this study, in order to investigate more effective way of exercise compared to normal walking, muscle activities of the lower limb were measured utilizing electromyography so as to study the quantitative and qualitative analyses about muscle activities during exercises. Measurements of muscle activities during SLR exercise and during the

examinations of the knee extension and flexion maximum strength in sitting position by electromyography showed that quantitative and qualitative evaluation of the muscle activities were possible. It also revealed that the amount or quality of muscle activities varies depending on the muscle difference. In particular, quality of muscle activities change by aging or it alters (frequencies decline) during continuous muscle contraction. In addition, we indicated the difference of the way or amount of muscle activities about several muscles in the lower extremities, depending on the normal walking, fast walking with wider stride or fast walking with increased pitch. And the amount of muscle activities was found to be increased during fast walking, both ways, and slow jogging compared to those during normal walking, and the muscles on which statistically significant increases were observed to be different depending on the way of fast walking or slow jogging. From these not merely conducting normal walking, but adopting different way of fast walking or slow jogging will lead to the training of various type of muscles and attain more effective exercise.

より有効な運動となることが示された。

要 旨

健康増進のための運動として、ウォーキングが広く行われているが、より効果的な方法を検討するために筋電図による下肢筋活動の測定を行い、量的、質的な評価や運動時に活動する下肢筋肉の違いを調べた。SLR 運動ならびに座位での膝伸展屈曲筋力測定時の下肢の筋活動を筋電計測により、量的また質的に評価をすることが可能であることが示され、筋肉の種類により活動量ならびに活動の量や質が異なり、特に筋活動の質について、加齢による変化や筋活動を持続することによる変化を示すことができると考えられた。また通常歩行と2種類の速歩（歩幅増、ピッチ増）による各種筋肉の活動の様子の違いや活動量の違いを示した。さらには、通常歩行と比べ、2種類の速歩、スロージョギングでは筋活動が増えるが、有意の差を持って活動量が増える筋はそれぞれ異なっており、通常のウォーキングのみでなく、様々な歩き方やスロージョギングを間に取り入れることで、異なった種々の筋肉を鍛えることに繋がり、