Correlation between Mid Upper Arm Muscle Area/Size and Muscle Strength

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Abstract

Background: Muscle area/size reflects the true magnitude of muscle tissue changes. Muscle strength is an active tension generated by muscle that depends on its capacity to exert force on an object. The relation between the quantity of muscle area and the amount of muscle strength is suggested. The aim of this study was to analyze the correlation between mid-upper arm muscle area/size and muscular strength.

Methods: This analytic study with ten subjects (medical students) who met the inclusion and exclusion criteriawas conducted at the Faculty of Medicine Universitas Padjadjaran in Jatinangor campus from 22th of April to 1st of November 2014. A skinfold calliper was used to measure triceps skinfold while a measuring tape measured the mid-upper arm circumference and a dynamometer measured the muscle strength. A formula was used to determine the mid-upper arm muscle area/size using mid-upper arm circumference and triceps skinfold. The collected data were analyzed statistically using correlation test and simple linear regression.

Results: There was a strong correlation between mid-upper arm muscle area/size and muscular strength (correlation cooefficient 0.746). Moreover, the higher the Body Mass Index, the stronger the muscle strength was to some point. If the BMI was more than 25 kg/m^2, this findings did not occurred.

Conclusions: There is a strong positive correlation between mid-upper arm muscle area/size and arm muscle strength. **[AMJ.2016;3(4):590–5]**

Keywords: Mid-upper arm, muscle area/size, muscle strength

Introduction

Muscle is an organ that produces movement of an organism by contractions.[1] Muscular strength is produced by contraction of muscles. It is the ability of an animal or human to exert force on physical objects using muscle depends on its capacity to generate active tension.[2] Mid upper arm muscle area reflects the true magnitude of muscle tissue changes.[3] Training the muscle to increase its area can have many advantages, among others is in preventing limb muscle dysfunction in chronic obstructive pulmonary disorder.[4]

It is widely accepted that the muscle force produced is directly proportional to its cross-sectional area. Ikai and Fukunaga[5] discovered that there was a positive relationship between cross-sectional area and maximum isometric strength of musculus biceps brachii. Somehow, Brad Jon's study showed that a small to moderate muscle hypertrophy did not have significant effect on muscle strength.[6] This contradiction leads to the need of this study.

This study was conducted among medical students from the Faculty of Medicine Universitas Padjadjaran to discover the correlation between mid-upper arm muscle area and muscular strength.

Methods

This study was carried out using an analytic study with numeric variables of independent and dependent variables.

The study population was the medical students in the Faculty of Medicine Universitas Padjadjaran and was conducted at the Faculty of Medicine Universitas Padjadjaran, in Jatinangor campus from 22th of April to 1st of

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