

**E31013** Relationship between Muscle Strength and Muscular Endurance, and Rope Climbing Speed in Japanese Wrestlers

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**Purpose:** The purpose of this study was to clarify the relationship between muscle strength and muscular endurance, and rope climbing speed in the Japanese wrestlers.

**Method:** Subjects were 17 Japan national team wrestlers. Isometric strength consisted of back strength, elbow flexion and grip strength. Muscular endurance, consisting of sit-ups and push-ups, was measured at 60 seconds. Rope climbing speed was assessed for climbing up an 8 meter rope. Subjects sat on the floor at the start and climbed up without using their lower limbs.

**Results:** Rope climbing speed showed a significant negative correlation with body weight, lean body mass and fat mass. On the other hand, rope climbing speed showed a significant positive correlation with back strength, elbow flexion, grip strength and sit-ups.

**Conclusion:** Not only the muscle strength of upper limbs but also the muscular endurance of the trunk was important for the rope climbing. It suggest that rope climbing is important for training in wrestling.

**Key words:** wrestling, muscle strength, muscular endurance, rope climbing

**E41001** Metabolic Properties of the Skeletal Muscles of OLETF Rat

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**Purpose:** Histochemical and biochemical properties of the skeletal muscle of OLETF (Otsuka Long-Evans Tokushima Fatty) rat, a model animal of NIDDM, were investigated.

**Methods:** Ten male OLETF rats of 24 weeks of age were used. Ten male Long-Evans Tokushima Otsuka (LETO) rats of the same age were used as controls. The plantaris and soleus muscles were removed under pentobarbital anesthesia and frozen in liquid nitrogen. Later, muscle triacylglycerol(TG) Concentration and myosin heavy chain(MHC) composition were determined. Phosphofructokinase(PFK) and malate dehydrogenase(MDH) activities were also measured.

**Results and Discussion:** TG concentration of the plantaris and soleus muscles were significantly higher in OLETF rats than in LETO rats. No significant difference existed between groups in % MHC of the plantaris muscle. However, in the soleus muscle, % MHC1 was significantly higher and % MHC2a was lower in OLETF rats. MDH activity levels were in accordance with the results of MHC composition; the reduced MDH activity was observed in the soleus muscle of OLETF rats while there was no significant difference between groups in MDH activity of the plantaris muscle. It is suggested that higher TG concentration and lower oxidative enzyme activity of the skeletal muscle in OLETF rats play a crucial role for inducing insulin resistance.

**Key Words;** OLETF rat, skeletal muscle, metabolic property