RELATIONSHIP BETWEEN MUSCULAR STRENGTH AND ANAEROBIC POWER IN BRAZILIAN PREPUBERAL MALE SOCCER PLAYERS

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Power achieved during maximal exercise bouts may reflect the anaerobic power of an individual. Children normally show lower performance in such activities when compared to adults. It is supposed that anaerobic capacity is limited in children due to an impaired anaerobic energy production (Bar-Or, 1984). However, the relative contribution of factors involved in power production and performance during maximal exercise bouts is not well known (Mercier et al. 1992). Purpose of the present investigation was to correlate power output during a single maximal exercise bout on a cycle ergometer and maximal isokinetic strength in trained prepubertal males. Sixteen prepubertal (Tanner’s stage 2; 12,1 ± 0,7 years old) male soccer players (at least 2 years of participation in regular training and competing at national brazilian level) were submitted to two different exercise situations. Initially, subjects performed a single maximal exercise bout on an Monark-type cycle ergometer (Insera, Brazil) with the same characteristics of the Wingate anaerobic test but with a duration of 15 seconds (load was set at 7.5% of total body mass). Blood lactate concentration was determined enzymatically from the finger tip three minutes after exercise cessation in complete rest. Peak (Ppeak) and mean (Pmean) power were measured continuously during exercise (MCE Software, Poland). After at least three days, subjects carried out two maximal isokinetic strength tests (Biodex 3 System Pro®, USA) in angular velocities of 60 degrees / sec (ISO60) and 180 degrees / sec (ISO180). Maximal torque (Tmax) and total work (Wt) were measured. High and significant (p < 0,05) Pearson's correlation coefficients were found between isokinetic strength and cycling performance, whereas correlations were slightly higher for ISO180, where Ppeak correlated significantly with Tmax (0,94) and Wt (0,89), and Pmean correlated with Tmax (0,93) and Wt (0,88). Tmax achieved during ISO60 correlated with Ppeak (0,89) and Pmean (0,86), and Wt correlated significantly with Ppeak (0,81) and Pmean (0,81) as well. Maximal blood lactate concentrations determined 3 minutes after exercise were 7,0 ± 1,7 mmol/l. They did not significantly correlate with Pmean (0,41) and correlated significantly but only moderately to Ppeak (0,67). Results indicate that in addition to anaerobic energy production, muscular strength plays also an important role on power output during short, maximal exercise bouts in trained prepubertal boys.

Keywords: Children, Anaerobic Power, Strength