THE RELATIONSHIPS BETWEEN ANTHROPOMETRIC GROWTH AND PHYSICAL FITNESS CHANGES IN PRE- AND POST-MENARCHEAL GIRLS DURING MID-ADOLESCENCE: A LONGITUDINAL STUDY

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Introduction: Growth and biological maturation processes are closely related. Both influence functional abilities, body composition and physical abilities of humans, which again affect their motor and physical fitness performance, especially during the mid-adolescence period. **Methods:** A longitudinal research design that covers a two year period was used based on a convenience sample of high school children in Gr8 a baseline. Muscle strength and aerobic endurance were measured once a year annually from 2010-2012 (2-year period) while anthropometric measurements (stature, body mass, sitting height, arm span, sitting height ratio. BMI), were measured three times per year, 4 months apart. The group of girls (mean age 13.51 years) were divided into 2 maturational group namely pre-(n=13) and post menarcheal (n=45) according to menarcheal status during baseline (Status Quo method). Protocols from ISAK (Marfell-Jones et al., 2014), the Canadian Sport for Life (CS4L) (Simmons, 2000) and the Australian Sports Commission (1996) were used to analyse the data. Basic statistics, a repeated measures ANOVA with a Bonferonni post hoc correction and Spearman correlation analysis were used.**Results:** Post menarcheal girls (n=45) were taller and heavier at baseline measurements, and had longer limbs compared to pre-menarcheal girls (n=13), although pre-menarcheal girls showed larger anthropometrical increases between measurements. Post menarcheal girls showed better although not statistical significant upper body muscle strength ($p>0.05$) throughout the study with pre-menarcheal girls showing higher aerobic capacity ($p>0.05$). Post-menarcheal girls showed small to medium and pre-menarcheal girl's medium tot strong correlations between changes in anthropometric growth and physical fitness abilities. Most correlations ($p<0.05$) in both groups were found between aerobic capacity and body mass, sitting height and sitting height ratio, where higher mass showed negative influences on aerobic capacity. **Conclusion:** Age at menarche has a significant role in the growth and physical fitness performance of girls especially at the age of 13-years. Late maturing girls tend to be smaller in stature with poorer strength but catch up and surpass early maturing girls at a later stage. Biological age of girls during the mid-adolescence period should therefore be kept in mind during talent identification and sport development programs.

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