hereditary, physical and functional criteria, and this, at the time when the body is undergoing the complex changes of somatic growth and sexual maturation, complicates the interpretation of exercise – related adaptations.

Development in boys is mainly dependent on the interaction of the progressive increase in androgens and growth hormone, causing characteristic changes in body constitution, distribution of fat tissue and muscular strength.

The effect of intense training on the pituitary axis of adults has been thoroughly studied and reflects the biological and psychological stress related to exercise. The biological responses to intense training are related to the metabolic and neuromuscular features of the exercise, with strength training clearly causing adaptations different from other forms of exercise such as aerobic activities. There are few data however for athletes in the pre-pubertal period, while the effects of different forms of exercise on sedentary pre-pubertal and pubertal individuals are conflicting. Specifically, T and FAI mean values have been reported to increase, remain stable or decrease, following acute intense exercise or two-month to one-year training.

The aim of this study was to compare: a) the levels of hormonal parameters which are related to growth and maturity (Testosterone (T), sex hormone binding globulin (SHBG), free androgen index (FAI), growth hormone (GH)) in pre-pubertal and early-pubertal boys who systematically participate in individual and team sports activities of endurance, strength, speed and skill, and b) the effect of two different forms of exercise (aerobic and weight training) on androgens in sedentary pre-pubertal boys since the results of studies on well trained athletes cannot be extended to other population groups.

SUBJECTS AND METHODS

a) Athletes

Eighty (80) children belonging to 8 groups were included in the analysis: 11 runners, 11 swimmers, 9 basketball players, 9 handball players, 10 rowers, 8 weight-lifters and 8 fencers. Their age ranged from 11 to 13 years. The control group consisted of 14 boys of the same age range. The athletes had been selected via school and national development sport talent programmes under the minimum criteria of 8 months of regular athletic training, appropriately designed for the age group, and were subjected to moderate intensity training programmes at least 3 times a week, enabling them to learn the basic kinetic patterns of each sport. The boys who participated in the control group were screened from a large number of schoolboys on the maximum criteria of regularly attending standard school physical exercise classes. Anthropometric characteristics of all subjects are presented in Table 1.

b) Sedentary boys

Twenty nine boys are included in this group. Nine boys aged 11-13 yrs were subjected to a two-month regular weight training programme, 3 times a week,