Varicocele and sport in the adolescent age. Preliminary report on the effects of physical training

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ABSTRACT. The effect of physical training on the natural history of varicocele has received little attention. The aim of the present pilot study was to evaluate the prevalence of idiopathic varicocele in young athletes, in the attempt to find a correlation between the training workload and the clinical grade of varicocele. We evaluated 150 adolescents with an age of 10-16 yr (median age: 13 yr). All these subjects were athletes practicing different sport at agonistic level. We evaluated 150 adolescents with an age of 10-16 yr (median age: 13 yr). All these subjects were athletes practicing different sport at agonistic level. One hundred and fifty non-athlete adolescents of matched age (median: 13.5 yr) were used as controls. All underwent physical examination, and if a varicocele was suspected, the diagnosis was confirmed or excluded by echo-color-Doppler examination. The young athletes were stratified into two groups according to the different time spent for training: Group 1 - 6 h training per week; Group 2 - 7 to 12 h per week. Statistical analysis was performed. A p<0.05 was considered significant. The physical examination revealed a clinical varicocele on the left side in 20 athletes. A significant positive correlation was observed between the Group 2 and the highest grade of varicocele (r²=0.9918, p=0.0041). In the adolescent group used as control we observed a varicocele in 16 cases. A positive correlation was observed between the number of athletes with varicocele and the highest grade of varicocele (r²=0.96, p=0.02). Sport training does not modify the prevalence of varicocele compared to the general population, but physical activity has to be considered as an aggravating factor in the natural history of varicocele. In countries where sport eligibility is necessary for agonistic sport practice, varicocele should be then considered as a conditioning factor. (J. Endocrinol. Invest. 27: 130-132, 2004) ©2004, Editrice Kurtis

INTRODUCTION

Varicocele is one of the most common pathologies of the adolescent age with a reported incidence varying between 9% and 25.8% (1). Adolescents are frequently involved in physical activities even of elevated intensity that require an agonistic sport eligibility granted by a competent authority. There are very few epidemiological studies that correlate the effects of physical intensive training with varicocele in the adolescent age (2). As a consequence, varicocele is not always considered as an aggravating factor in young athletes affected by varicocele. The aim of the present pilot study was to evaluate the prevalence of idiopathic varicocele in young athletes compared to non-athletes of matched age. We also tried to find a correlation, if any, between the training workload and the clinical grade of varicocele.

MATERIALS AND METHODS

In the present study we evaluated 150 adolescents aged between 10 and 16 yr (median age: 13 yr). All these subjects were athletes practicing different sports at agonistic level. They had all required eligibility for their activity. One hundred and fifty non-athlete adolescents of matched age (median: 13.5 yr) were used as controls. All underwent a physical examination and if a varicocele was suspected the diagnosis was confirmed or excluded by echo-color-Doppler examination. The parameters evaluated were: age, pubertal development, grade of varicocele (if any), and hours of training (Table 1). The pubertal development was evaluated according to Tanner stages. Varicocele was classified in grades according to Horner. The young athletes were divided into two groups according to...
the different time spent for training: Group 1 - 6 h training per week; Group 2 - 7 to 12 h per week. The training work-load was intensive and similar in both groups.

Statistical analysis was performed calculating the correlation coefficient (Pearson) and a simple linear regression analysis to correlate the clinical grade of varicocele with the training time-table (Group 1 and Group 2) and the incidence of different grades of varicocele between the athletes and the non-athletes. A $p < 0.05$ was considered significant.

RESULTS

The sports practiced were: soccer in 90 subjects, athletics in 30, rugby in 15 and gymnastics in another 15 athletes. According to the training time-table (hours/week) athletes were stratified in: Group 1, 38 athletes; Group 2, 112 athletes.

The physical examination revealed a clinical varicocele on the left side in 20 athletes (prevalence 13.3%); the diagnosis was confirmed by a Doppler study. According to Horner, the varicocele could be classified as grade 0 in 1 case, grade I in 4 cases, grade II in 7 and grade III in 8 cases. Of Group 1, 1 subject had a varicocele of grade 0, 2 had grade I and 2 had grade II, (overall prevalence: 13.2%). In Group 2, 2 subjects had a varicocele of grade I, 5 had grade II and 8 had grade III (overall prevalence: 13.4%). A significant positive correlation was observed between the Group 2 (7-12 h training) and the highest grade of varicocele ($r^2 = 0.9918$, $p = 0.0041$) (Fig. 1).

The prevalence of varicocele was similar in the different sports practiced: soccer (14.4%); athletics (10%); rugby (13.3%); gymnastics (13.3%).

In the adolescents used as controls we observed a varicocele in 16 cases (prevalence 10.7%). These were stratified according to the clinical grade in: grade 0 - 5 subjects, grade I - 4 subjects, grade II and III - 4 and 3 subjects respectively.

The prevalence of varicocele in the population practicing sport was similar to the one observed in the control group (13.3% vs 10.7% respectively). A positive correlation was observed between the number of athletes with varicocele and the highest grade of varicocele ($r^2 = 0.96$, $p = 0.02$), on the other hand the incidence of the higher grade of varicocele was almost inversely correlated with the non-athlete subjects (Fig. 2).

DISCUSSION

Varicocele is the most common cause of male infertility; it is present in 35-40% of infertile adults (3). Pathogenesis is still controversial and different hypotheses have been put forward (1). Recently, our group demonstrated a focal damage at the level of the intratubular (4) and extratubular compartments (5, 6). Nitric oxide has been considered a potential source for oxidative damage to the testis and seminal liquid (7, 8).

The natural history of adolescent varicocele has not been completely elucidated and the relationship with the practice of sport has received little attention (2). Recently, the importance of sport medicine has been reported in the diagnosis and prevention of testis diseases in the adolescent age. A survey in young males has revealed that they are unaware of testicular problems as a reason for genital examination (9). For these reasons, varicocele in adolescents needs particular attention.

In a recent trial, a high incidence of varicocele in adult athletes has been observed (10). Physical exercise activates the hypothalamo-pituitary-gonadal axis with secretion of different hormones. This kind of secretion is directly correlated with the length and the intensity of training. In male athletes in particular, physical exercise can cause qualitative alterations in the seminal liquid and infertility. Very recently the effects of the intensive training in adults have been studied reporting a negative impact on morphology and motility of spermatozoa in athletes.