

Original Article

Varicocele in adolescents: new findings and certainties among volume, hormones and semen analysis. Open perspectives

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Received March 30, 2021; Accepted May 26, 2021; Epub June 15, 2021; Published June 30, 2021

Abstract: Varicocele and varicocelectomy, and the clinical indications to treat it in pediatric age are still under discussion. Through the study of a recent work on the association between varicocele, hormones, and semen analysis, we comment on new results related to the management of varicocele in pediatric age. In this new study, it has been reported that there is a correlation between abnormal semen analysis and FSH value, an association between abnormal semen analysis and other hormonal values (i.e. inhibin B) and an association between abnormal semen analysis and testicular volume. If these data are confirmed it is possible to suggest new diagnostic and therapeutic strategies in the treatment of pediatric varicocele.

Keywords: Varicocele, pediatric age, hormone, fertility, semen

Introduction

The treatment and management of varicocele in pediatric-adolescent age is essentially characterized by the presence of testicular hypotrophy. But as it is often reported, medicine must prevent organ damage. At our Center, while waiting to perform semen analysis, which is recommended for all boys with completed pubertal development, testicular hypotrophy remains the only indication for surgery. We monitor patients with Doppler velocimetry and know that all patients at risk of hypotrophy are those who have continuous spermatic vein reflux. But less it is known about varicocele and hormones in pediatric age, I read with pleasure and attention the recently published work by Van Batavia JP on varicocele, hormone levels, and semen quality [1]. In their study the authors report some important data: the correlation between abnormal semen analysis and FSH value, the association between abnormal semen analysis and other hormonal values and the association with testicular volume. If the correlation between testicular volume and

semen quality is confirmed, as for adult where a 15 ml testicular volume is considered to have at least 1 alterations of spermatogenesis (motile sperm, count, vitality, etc), we can use this data also in pediatric age. However the minimum value has not been calculated perhaps because the criterion of evaluation was the total motile sperm count alone.

It is now well established, regardless of the prevalence and incidence of varicocele reported by different series, that the issue is no longer to be considered only related to testicular volume, but other values and parameters must be monitored. In the era of assisted reproduction, many authors postulate that in adulthood with infertility, the varicocelectomy is less and less justifiable or at least it could be performed after obtaining a pregnancy. However, little has been done and studied for adolescents. Although the association between varicocele and alteration of semen is well known even in adolescents, little is known about association of varicocele and alteration of hormonal values. Recently, our group has also shown the associ-

ation with FSH values, which are, as in adults, of fundamental importance. The evidence of the literature show that even in pediatric age (if it is considered a pediatric age between 16 and 18 years), there is a negative impact of varicocele on testicular function, including sperm abnormalities, testicular hypotrophy and hormone alterations. Those working with varicocele in pediatric age have therefore several tools to manage and monitor the evolution: we know that testicular asymmetry greater than 20% is associated with lower semen quality, the type of spermatic vein reflux is associated with testicular hypotrophy and now, hormonal values are strictly associated with testicular function as in adulthood and therefore to the semen quality. So, in adolescent and pediatric age, we can use also hormonal tests with radiological and clinical evaluation to suggest varicocelectomy, and we can use hormonal tests to monitor these patients until semen analysis is performed [1-4].

As reported by Authors, the combination of testicular volume and hormonal values may help in those cases where a semen analysis is not practical option, for example for parent decision or for religious reasons or simply for personal reasons. What we know is that total motile sperm count is inversely associated with follicle-stimulating hormone levels, and total testicular volume. In adolescents we need to optimize cutoffs for hormones and testicular volume to predict those in need of varicocelectomy; so, total testicular volume and FSH and inhibin B levels may prove to be reasonable surrogates for total motile sperm count. Van Batavia JP reported that an optimal follicle-stimulating hormone cutoff of 2.9 U/l can predicts abnormal total motile sperm count. This data offers important reflections: considering the critical level of FSH for the adult (8 U/l) to highlight an alteration of the seminal fluid, the proposed cutoff seems to be very low or very far from the threshold value in adulthood. A finding that should be studied is the possible correlation with the clinical grade and the possible association with testicular hypotrophy. Probably, most patients with varicocele, do not have high values of FSH, which is the fundamental hormone for spermatogenesis, so high values must be associated with a possible testicular damage. Testicular damage is not always associated with reduced volume but it is associated with altered spermatogenesis.

Future research on varicocele needs important changes and, above all, more homogeneity on some important aspects: the first, perhaps the most difficult, is to select homogeneous patients especially on pubertal development and age range. In many studies 14-year-old and 21-year-old patients are compared and this difference could be an important bias especially for lifestyle and habits. Second aspect, to ensure a homogeneous result on the assessment of testicular volume, a fundamental element for the surgical indication. The third aspect is then to evaluate on large numbers the role of hormonal balance of adolescents with varicocele by correlating the quality of seminal fluid and each hormone. It is now well established that more than 60% of the pathologies that alter the fertility potential in adulthood can be diagnosed and treated already in pediatric age, and varicocele corresponds to 40% of these pathologies. Therefore, varicocele must be diagnosed early (for example using screening programs) and monitored over time. What emerges from the latest researches is not how to operate the varicocele, but when and why. Therefore, the fertility potential needs a global evaluation, as standardized as possible, without forgetting the subjectivity of each patient.

Disclosure of conflict of interest

None.

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