Echo-colour Doppler Ultrasonography in the Diagnosis of Varicocele

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The relationship between varicocele and infertility has long been defined. About a third of the male patients undergoing evaluation for infertility present with a varicocele. Sixty male patients between 17 and 35 years of age (mean 25.6) were examined with a colour-doppler flow imaging system. The diameters of the veins in the pampiniform plexus were measured by gray-scale sonography.

Our findings were classified with regard to venous diameter, the existence or non-existence of reflux, the circumstances under which these findings were recorded (e.g. during normal respiration and standing position or during Valsalva manoeuvre and supine position). Finally our results suggest that: (a) the clinical significance of the presence of dilated veins or reflux during increased intraabdominal pressure and under similar circumstances should be regarded with caution; (b) positive findings during normal inspirium are highly significant (grades III and IV).

Introduction

The diagnosis of the aetiological cause and the mode of treatment of infertility is important due to its relative frequency (15% of all married couples) and to its direct sociopsychological consequences [1, 2]. Conception is achieved during the first year by married couples who do not apply contraceptive measures. Female factors were used to be thoroughly investigated initially, but the knowledge of recent decades has shown that infertility is the consequence of male factors in 30% of infertile couples.

The relationship between varicocele and infertility has long been defined. Celsius, in the first century A. D., has described varicocele as dilatation of the veins above the testicle which is affected and atrophic [3]. The contemporary definition of varicocele is the dilatation of the veins of the pampiniform plexus due to reflux. About a third of the male patients (19–47%) undergoing evaluation for infertility present with a varicocele. The incidence of varicocele is lower in the general male population [4]. This incidence has been found to be 9.5% among 17–24 years old males [5]. Another study has revealed that varicocele exists in 15% of healthy males [6]. Infertility rates among males with varicocele have been reported to be 2 to 3 times that of normal males, i.e. 20–40% [5]. Deterioration of semen quality and a decrease of testicular
volume are seen in the semen of patients with varicocele. There are some studies reporting that varicocelectomy does not correct semen parameters and does not end up with pregnancy [3, 7].

However, it is generally accepted that the fact that varicocelectomy does not correct semen parameters does not mean that varicocelectomy is not responsible for the infertility in those patients. The more frequent co-existence of varicocele with abnormal sperm parameters than normal sperm counts also supports the general tendency to accept that varicocele is consistent with male infertility. Regarding the potential of fertilization, the percentage of motile spermatozoa and the morphology of spermatozoa are more significant than the number of spermatozoa [8].

It has been shown, on the other hand, that varicocele has deleterious effects on spermatogenesis. These effects are mainly on morphology and motility and are not directly related to the grade of varicocele. Improvement of sperm morphology and motility postvaricocelectomy has been reported to be between 60 and 81%. Postvaricocelectomy conception rates have been reported to be 31–55% [8].

Physical examination remains to be the main tool in the diagnosis of varicocele. This examination should be done while the patient is standing, in order to detect the dilated veins.

**Material and method**

Sixty male patients between 17 and 35 years of age (mean 25.6) with normal levels of serum gonadotropin and testosterone hormones and without any sexual dysfunction were evaluated. These patients were divided into groups of those who were fertile and those who were infertile and then each group was subdivided into those with or without varicoceles. Three samples of semen from each patient were assessed in the infertile group. No changes other than varicocele could be found in these patients or in their wives.

Clinical varicocele was evaluated with regard to the palpable or visible veins in the spermatic cord in a warm room.

Three samples of semen from each patient were also assessed in the fertile group. All patients in this group had fathered children.

These patients were then examined with a colour Doppler flow imaging system and 7.5 mHz linear-array transducer (Hewlett-Packard-Sonos 1000). The 7.5 mHz transducer was applied to the patients transscrotally as well as transinguinally. Both testicular units were examined in supine and upright positions and during normal inspirium and Valsalva manoeuvre. The diameters of the veins in the pampiniform plexus were measured by gray-scale sonography. Then coloured imaging was done by placing the Doppler probe in the direction of flow in the spermatic vein under the guidance of visible flow.

The velocity and the volume of the retrograde venous flow in the internal spermatic vein were assessed during normal respiration and Valsalva manoeuvre.