WHAT IS KNOWN ALREADY?

Varicocele has adverse effects on spermatogenesis and to date is considered as the first cause of male infertility. Many factors negatively affecting semen quality act through decreasing energy availability by mitochondrial dysfunction and sperm are also vulnerable to reactive oxygen species because their accumulation leads to membrane damage, instability and functional alterations. However, for normal sperm cell function, a delicate redox balance of reduction and oxidation is required. Thus, a therapeutic strategy would need to use supplements to increase sperm energy metabolism, minimize free radical damage and improve the cellular processes connected with the formation and maturation of sperm.

STUDY DESIGN, SIZE, DURATION

To evaluate, utilizing a randomized double-blind placebo controlled trial, the effect of supplementation with selected naturally compounds on pregnancy rate and sperm quality. The effect was evaluated in subjects with oligo or asthenoteratozoospermia, as well as with or without varicocele.

PARTICIPANTS/MATERIALS, SETTING, METHODS

With a block randomization 104 patients were enrolled: 52 had grade I-III varicocele and 52 were not affected. Patients were further divided in two groups consisting of the supplementation arm and the placebo arm. The supplementation formulation consisted of L-carnitine, fumarate, acetyl-L-carnitine, fructose, citric acid, selenium, coenzyme Q10, vitamin C, zinc, folic acid and vitamin B12. Spermogram evaluation was done at the beginning of treatment and after 6 months, at the end.

MAIN RESULTS AND THE ROLE OF CHANCE

Adverse events occurred only in the treatment group: 4 patients had nausea and 3 vertigo or headache. Twelve pregnancies occurred during follow-up time: 10 in supplementation group (9 non-varicocele and 1 varicocele) and 2 in placebo group (1 non-varicocele and 1 varicocele). One spontaneous abortion was reported in placebo arm. Mean changes of number of sperm (10⁶ x mL) after treatment were 1.7 in the placebo group and 9.8 in the supplemented group (p=0.0186). Mean changes of sperm concentration (10⁶ x mL) after treatment were 13.0 in the placebo group and 46.9 in the supplemented group (p=0.0117). Mean changes of progressive motility of sperm (%) were 1.7 in the placebo group and 5.9 in the supplement group (p=0.0088). Mean changes of total motility of sperm (%) were 1.6 in the placebo group and 7.3 in the supplement group (p=0.0120). Analyzing typical and atypical morphology there was, respectively, a difference of -6.1 and 5.9 in the placebo group while -6.7 and 3.6 in the supplement group.

LIMITATIONS, REASONS OF CAUTIONS

We did not compare the effect of this treatment with surgical treatment of varicocele and we did not evaluate DNA fragmentation and level of ROS. Furthermore, latest evidences report that evaluating OS can be a diagnostic tool in predicting the best responders to supplementation.

WIDER IMPLICATIONS OF THE FINDINGS

Oxidative stress is a cause of male infertility with significant negative effect on semen parameters and varicocele is an additional cause of poor sperm quality. The use of carnitines and other functional substances is an efficacious strategy to handle male infertility. All sperm parameters significantly increased in treated subjects, while a strong increase in pregnancy rate was reported only in non-varicocele arm.