Sperm DNA fragmentation index (DFI) and α-glucosidase are good predictors for prognosis of sperm motility in oligoasthenozoospermic men, treated with carnitine and essential nutrients

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Study questions
This study wanted to correlate DFI, seminal α-glucosidase and progressive sperm motility in a group of 175 oligoasthenozoospermic men treated with special test formulation.

What is known already
L-carnitine is concentrated in high energy demanding tissues and it plays an important role in transferring long-chain fatty acids into the mitochondria for beta oxidation, producing energy. In addition, it modulates acyl-CoA/CoA ratio, stores energy as acetyl carnitine and reduces ROS. DNA damage, such as fragmentation and denaturation, can have adverse effects on fertilization and embryo development. Infertile men have a greater extent of sperm DNA damage and poor sperm DNA integrity than fertile men. Alpha-glucosidase is a normal constituent of human semen and produced mainly in the epididymis and it is also considered a marker of functional epididymis.

Main results and the role of chance
The parameter values were: DFI (%): T0=38,50 (32,00-48,75), T3=35,50 (25,50-44,00) and T6=32,50 (25,00-41,00) FIG 1.; seminal activity of alpha-glucosidase (U/L): T0=25,40 (20.00-42.88) and T6=32.50 (23.00-42.83) FIG 2.; the progressive sperm motility (%): T0=28,00 (12,00-38,00), T3=30,00% (12,0-39,00) and T6= 31,00% (20,00-41,00) FIG 3.; these parameters showed significance of p<0.001 (DFI and motility) and p<0.002 (alpha-glucosidase) done by Wilcoxon rank test. Further the Spearman’s rank-order correlation test showed that the increase of seminal alpha-glucosidase (R=0.246; p < 0.046) levels influenced the progressive sperm motility. Thus the correlation of seminal plasma α-glucosidase (AUC= 0.752) and progressive sperm motility showed that in man an increase of seminal alpha-glucosidase of 12%, after six months therapy, would impact progressive sperm motility.

Study, design, size, duration
This study was randomized, double blind, placebo controlled (DBPC) and examined the effect of combination (Proxeed®Plus), containing L-C 2g and ALC 1g, as well as antioxidants, vitamins and minerals, in men with idiopathic oligo-asthenozoospermia (age group 18-50 years). The protocol was 2 months wash-out and 6 months treatment (T0=0, T3, T6), with test combination (125 patients) or placebo (50 patients).

Participants/materials, setting, methods
Men (age group 18-50 years) with idiopathic oligoasthenozoospermia, and history of difficulty conceiving >12 months were randomized to receive treatment or placebo in a double blind protocol. Analysis of ejaculate was done according to WHO 5th guideline. Progressive sperm motility (rapid, progressive) was done manually. DFI was evaluated by HaloSperm kit (Halotech DNA, S.L, Madrid) and seminal alpha-glucosidase was measured by a biochemistry analyzer (Con-tec Bc 300, Beijing, China).

Wider implications of the findings
This study demonstrated, after six months therapy, that increase of seminal alpha-glucosidase positively impacts upon the patient progressive sperm motility. Further the decrease of DFI after therapy can be used as an independent predictor of progressive sperm motility higher than 10%.