Title: Glutathione and glutathione-dependent enzymes in sperm and seminal plasma from infertile men

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Objective: Both glutathione (GSH) and glutathione-dependent enzymes - glutathione peroxidase (GPx) and glutathione-S-transferase (GST) play an important role in antioxidant scavenger system. GSH acts directly with hydrogen peroxide, superoxide anion, hydroxyl and alkoxyl radicals. Due to its structure GSH easily gives away a proton. GSH is used by GPx and GST for restoration of damaged biomolecules. The objective of our study was to determine the levels of GSH, GPx and GST in partners of couples enrolled in ART clinic.

Design: Prospective study

Materials and Methods: A total of 91 patients were grouped according to their semen characteristics: group 1: normozoospermic (n = 40) which served as the control; group 2: asthenozoospermic (n = 30) and group 3: teratozoospermic (n = 21). Semen analysis was done according to the WHO guidelines. Total GSH and levels of GPx and GST were measured in spermatozoa and seminal plasma colorimetrically. GSH was measured by 5, 5'-dithio-bis-2-nitrobenzoic acid method and read at 412 nm. The activity of GPx was measured by the change in GSH concentration before and after incubation with glutathione and measuring the absorbance at 412 nm. GST was detected at 340nm by measuring total GST activity by conjugation of 1-chloro-2,4-dinitrobenzene with reduced glutathione. Protein concentration was measured microbiuret method.

Results: Antioxidant levels in the 3 groups are shown in the Table.

Conclusions: Antioxidant levels are significantly reduced both in spermatozoa and seminal plasma of astheno- and teratozoospermic men. This may be related to the oxidative stress related pathophysiology of infertility in these men.

Support: None