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GLYCEMIC CONTROL AND OXIDATIVE STRESS IN SEMEN OF PATIENTS WITH TYPE 2 DIABETES MELLITUS

S. La Vignera¹, R. A. Condorelli¹, M. Catanuso¹, E. Vicari¹, R. D'Agata¹, A. E. Calogero¹

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Introduction. Diabetes mellitus has a negative impact on male fertility. Different dysfunctional mechanisms have been postulated to explain the sperm damage observed in diabetic patients. Among these, an increased oxidative stress (OS) seems to play an important role. Therefore, the aim of this study was to determine the levels of malondialdehyde (MDA), a lipid peroxidation subproduct, in the seminal plasma of infertile patients with type 2 diabetes mellitus and in healthy control men. **Materials and methods.** To accomplish this, 40 infertile patients with type 2 diabetes mellitus were enrolled. Their mean age was 36.5±8.0 years. They were divided into two groups according to their glycaemic control: Poor glycometabolic control (n=20), with glycated haemoglobin >10%; and good glycometabolic control (n=20), with glycated haemoglobin <7%. Healthy men (n=10) were enrolled as controls (36.3±2.0 years). A semen sample, obtained from each patient and control, was evaluated according to the World Health Organization criteria (WHO, 1999). MDA was evaluated using the thiobarbituric acid method. Data (mean±SEM) were analyzed by 1-way ANOVA followed by the Duncan test. Correlation analysis was conducted using the Pearson correlation test. **Results.** Both group of patients with diabetes has seminal plasma MDA level significantly higher compared to controls (0.19±0.02 nmol/ml) (p<0.05). Diabetics with a poor glycometabolic control had significantly higher MDA levels (0.95±0.35 nmol/ml) compared to patients with a good glycometabolic control (0.43±0.13 nmol/ml) (p<0.05). Correlation analysis in diabetic patients showed a significant negative relationship with the following sperm parameters: sperm concentration (r=-0.72; p<0.001), total sperm count (r=-0.63; p<0.001), progressive motility (r=-0.49; p<0.001), and normal forms (r=-0.55; p<0.001). **Discussion.** This study showed that infertile diabetic patients had a significantly higher seminal plasma MDA level and that this OS end-product increases with the worsening of the glycometabolic control. This is negatively associated with the main conventional sperm parameters.

PP014

BODY MASS INDEX CORRELATES WITH SEMINAL PLASMA INTERLEUKIN 8 LEVELS AND ULTRASONOGRAPHIC ABNORMALITIES OF THE PROSTATE IN INFERTILE MEN

F. Lotti¹, G. Corona¹, G. M. Colpi², E. Filimberti¹, S. Degli Innocenti¹, M. Mancini², E. Baldi¹, I. Noci³, G. Forti¹, L. Adorini⁴, M. Maggi¹

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This study is aimed at evaluating the association between body mass index (BMI), colour-Doppler ultrasound (CDU) features of the male genital tract (MGT), signs and symptoms of prostate inflammation and semen parameters. We studied 222 male patients (mean age 35.3 ± 7.0 years), attending our Outpatient Clinic for the first time, seeking medical care for couple infertility. According to the WHO classification, subjects were divided into 3 groups: normal weight (n=131, BMI=18.5–24.9 kg/m²), overweight (n=71, BMI=25.0–29.9 kg/m²) and obese (n=20, BMI ≥ 30.0 kg/m²). All patients underwent simultaneous assessment of testosterone levels and seminal analysis, including quantification of seminal plasma interleukin 8 (sIL-8) levels, along with scrotal and transrectal CDU, before and after ejaculation. Prostatitis symptoms were evaluated using the National Institutes of Health-Chronic Prostatitis Symptom Index questionnaire (NIH-CPSI). After adjusting for age and testosterone levels, higher BMI was significantly related to higher prostate volume and several CDU features of the prostate, including macro-calcification, inhomogeneity, higher arterial peak systolic velocity (the latter adjusted also for systolic and diastolic blood pressure), but not associated with abnormalities in other portions of the MGT, such as testis, epididymis, and seminal vesicles. Furthermore, higher BMI and BMI class were significantly related to higher sIL-8 levels, a reliable surrogate marker of prostate inflammatory diseases, even after adjustment for age. Conversely, no associations among BMI, clinical symptoms of prostatitis or semen parameters were observed. As overweight and obesity are associated with a systemic, low-grade inflammatory state, subjects with higher BMI might develop also CDU and biochemical signs suggestive of prostate inflammation, although not clinically overt.

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ACTIVATION OF SEMINAL MONOCYTE/MACROPHAGE SYSTEM IS ASSOCIATED WITH SPERM OXIDATIVE DNA-BASE ADDUCTS IN NORMOZOOSPERMIC SUBFERTILE MEN

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Introduction: Seminal monocyte/macrophages (MF) are the second most represented leukocyte subtype infiltrating the human ejaculate and their activation is suggested to mediate sperm damage through secretion of reactive oxygen species (ROS). Nevertheless, to date, only a couple of studies have been addressed to relationship between seminal monocyte/MF system and sperm quality. Here we analysed the association between the seminal monocyte/MF activation state and the intrinsic sperm levels of DNA 8-hydroxy-2'-deoxyguanosine (8-OHdG), a sensitive biomarker of oxidative DNA damage, the number of sperm with fragmented DNA, routine sperm parameters. **Materials and Methods:** Thirty non-leukocytospermic and normozoospermic ejaculates from the male partner of subfertile couples without known causes for male subfertility were preliminarily analysed for routine sperm parameters. Flow cytometry was applied for assessing the sperm DNA fragmentation, evaluated by TUNEL assay, the percentage of 8-OHdG positive sperm, evaluated by indirect immunofluorescence employing an anti-8-OHdG antibody, and the MF immunophenotype, combining fluorimetric analysis with monoclonal antibodies anti-CD14, a general marker of monocyte/MF lineage, and anti HLA-DR, a marker of activated MF. **Results:** CD14/HLA-DR double positive MF were correlated with 8-OHdG formation (r=0.68; p=0.0003) and the latter was negatively associated with sperm forward motility (r=-0.45; p=0.03). Multivariate linear regression analysis with stepwise selection of independent variables showed a significant association between 8-OHdG and CD14⁺/HLA-DR⁺ MF (β=0.98; p<0.001) and sperm forward motility (β=-0.56; p<0.01); CD14⁺/HLA-DR⁺ MF values explained 28% variation of 8-OHdG, whereas 8-OHdG levels explained 17% variation of sperm forward motility. **Conclusions:** Ejaculates from men without known causes for male subfertility and asymptomatic for genital tract infections, showed infiltration of activated MF and their presence, probably related to a chronic epididymal inflammation, was correlated with formation of oxidized DNA-base adducts whereas no relationships were found with sperm DNA fragmentation. The direct measure of activated MF offers a new tool in the evaluation of human male subfertility due to nuclear oxidative stress.

PP016

ULTRASONOGRAPHY OF EPIDIDYMS IN SUBFERTILE MEN: VARIABILITY OF QUANTITATIVE PARAMETERS IN 425 NORMOZOOSPERMIC AND OLIGOZOOSPERMIC MEN

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Introduction. The epididymis plays an essential role in male fertility, but its contribution to male subfertility still remains undefined. Ultrasonographic (US) epididymal evaluation has been so far restricted to qualitative subjective descriptions. The present study aimed to explore and to define quantitative and objective US epididymal parameters to be included in the diagnosis of oligo- azoospermia.

Materials and Methods. Men attending the Andrology Clinic at University of L'Aquila because of couple subfertility were included in a retrospective study that included semen analysis, serum levels of FSH and testicular US volume. Epididymal US parameters included the thickness of the caput and of the corpus evaluated in longitudinal scanion in both testes. All US evaluations were performed by two experienced examiners using a high-frequency (12-MHz) linear transducer. The mean values of the quantitative determinations of the two caput and of the two corpus epididymidis in each case (Caput-M, Corpus-M, respectively), were used for statistical analysis.

Results. Caput-M was correlated with testes volume assessed as mean of the two sides (p<0.001; r=0.22) and with FSH serum levels (p=0.0004; r=-0.22), but not with semen analysis, while no correlations were found between Corpus-M and all parameters. Epididymal US parameters were then compared in 4 categories of patients according to mean testicular volume, FSH serum levels, total ejaculated sperm, forward motility and seminal pH. The study included normal men (n=52), men affected by secretory azoospermia (n=56), excretory azoospermia (n=17), and oligoasthenozoospermia (OA) (n=300). Caput-M was highest in excretory azoospermia (10.9±2.2), and lowest in secretory azoospermia (8.6±2.1), compared to normal (9.4±1.9) or OA (9.6±3.4), while Corpus-M did not show differences among groups. This suggests that caput size in absence of obstruction was correlated with spermatogenic potential, while it was enlarged in case of obstructive azoospermia. However ROC curve analysis failed to show any cut-off values of Caput-M that significantly identified secretory or excretory azoospermia, as well as normozoospermic men.

Conclusions. Quantitative parameters in the US evaluation of the epididymis showed a limited value in the clinical evaluation of subfertile men. The contribution of epididymis to male subfertility, although extensively surmised, remains an undefined topic of clinical andrology.