

OR18-5: Elevated Semen Oxidative Stress in Male Partners as Novel Marker of Recurrent Pregnancy Loss

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Background: Idiopathic recurrent pregnancy loss (RPL) is the loss of three or more consecutive pregnancies prior to 20 weeks of gestation. Female factors in RPL are well known, but the influence of sperm function on RPL has been poorly understood. Recent studies demonstrate that male partners of women with RPL have higher risk of DNA fragmentation, but the underlying reasons have not been previously studied. Determining the mechanisms of sperm damage has potential to open new therapeutic approaches for couples.

Objective: To investigate the role of seminal reactive oxygen species (ROS) as a novel marker of sperm function in male partners of women with RPL.

Methods: Serum levels of reproductive hormones and sperm quality of male partners with RPL (N=49) were compared with a group of unaffected controls (n=34). All participants completed a questionnaire for conditions impairing sperm quality such as testicular surgery, chronic use of medication, sexually transmitted infections, smoking and alcohol intake. Semen ROS was measured using a validated in-house chemiluminescent luminol assay. DNA fragmentation was measured using the validated Halosperm G2 kit.

Results: Sperm morphology was significantly lower in the RPL group when compared with controls (% sperm with normal morphology: 4.5 ± 0.4 , control; 3.4 ± 0.3 , RPL, $P < 0.001$). Mean seminal ROS levels were more than 4-fold higher in the RPL group when compared with controls (mean semen ROS in RLU/sec/106: 2.3 ± 0.9 , control; 9.3 ± 4.2 , RPL, $P < 0.05$). Mean levels of sperm DNA fragmentation index (DFI) were more than 2-fold higher in the RPL group when compared with controls (mean DFI: 7.4 ± 1.2 , control; 16.3 ± 1.5 , RPL, $P < 0.0001$). Levels of serum morning testosterone (T) were non-significantly lower in the RPL group when compared with the control group (mean T in nmol/L: 17.9 ± 1.4 , control; 15.8 ± 0.8 , RPL, $P > 0.05$).

Conclusions: Our data suggest that male partners of women with RPL had elevated levels of semen ROS, elevated sperm DNA fragmentation and lower percentage of normal morphology when compared with controls. Our data have important implications for the management of couples with RPL as male partners of women with RPL may benefit from routine assessment of reproductive endocrine and sperm function.

Presentation Date: Sunday, March 24

Presentation Time: 11 a.m. – 12:30 p.m.

Location: Room 388