Title: Sperm chromatin damage and its role in the pathogenesis of infertility in
Objective: Factors that contribute to infertility in patients diagnosed with endometriosis, especially those with little or no distortion of their pelvic anatomy are poorly understood. This study sought to 1) evaluate the effect of coincubation of peritoneal fluid (PF) from patients with and without endometriosis on the extent of sperm DNA fragmentation, and 2) assess if DNA damage is consistent across PF from patients with endometriosis.

Design: Prospective controlled study

Materials and Methods: Experiment 1: Sperm from 22 normal donors were prepared by double density gradient and incubated with PF from 22 patients with various stages of endometriosis. HTF with 10% BSA was used as control. Sperm DNA fragmentation was assessed by TUNEL assay after 1.5, 4 and 24 hours incubation. Experiment 2: To validate the above experiment, 5 sperm donors were each incubated with 2 different PF samples from 10 endometriosis patients. In addition, 5 endometriosis PF samples were incubated with 2 sperm samples from 10 different donors. Sperm DNA fragmentation at the 3 time intervals was performed as above. Experiment 3: Sperm from 7 normal donors was incubated with PF from 7 patients with endometriosis as well as PF from 7 fertile patients undergoing laparoscopic tubal ligation as a control group.

Results: Sperm DNA damage was higher after incubation in endometriosis PF compared with either the HTF or normal PF controls at all 3 time intervals. All groups demonstrated a significant increase in sperm DNA damage after 24 hours incubation. Experiment 2 showed little variation when different sperm samples were exposed to the same PF as well as when the same PF sample was incubated with different sperm samples. Results are summarized in the table.

Conclusions: Peritoneal fluid from women with endometriosis consistently causes significant sperm DNA damage. This may be a contributory factor to endometriosis-associated infertility.

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