Title: DNA damage to embryos incubated in the peritoneal fluid of patients with endometriosis: role in infertility

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Objective: Endometriosis is more frequently diagnosed in patients with infertility than in the normal population. The cause(s) of endometriosis related infertility is still not defined. Epidemiological evidence supports the link between endometriosis and miscarriage. Oxidative stress is involved in the pathophysiology of endometriosis. Whether endometriosis affects the embryo quality or the endometrium receptivity is still unclear. The goal of our study was to study the effect of exposure of embryos to peritoneal fluid of patients with endometriosis and its effect on DNA damage.

Design: Prospective controlled study

Materials and Methods: 40 fertilized mouse embryos (8 cell stage) were randomly divided into two groups: Group I: 20 embryos incubated with peritoneal fluid of patients with endometriosis and group II: 20 embryos incubated with peritoneal fluid of patients with tubal ligation (control group). Cells were incubated for 48 h in the peritoneal fluid (50%: 50% vol./vol.) with HTF at 37°C in 5% CO₂. Blastocysts were fixed using 3% formaldehyde. Apoptosis in the developed blastocyst was analyzed by TUNEL assay by confocal microscopy.

Results: TUNEL assay for DNA fragmentation indicated an increased apoptotic index compared to the control group. In the endometriosis group: median (25th and 75th percentile) value was 7.9 (6.5 - 14.6%) while it was 39.1 (32.5 - 50.5%) in the control group. Results are summarized in the table below.

Conclusions: Embryonic development is a complex process during which chemical injury can lead to abortion or embryonic malformation. It may lead to damage to embryos DNA as evident by increased apoptosis. This may be an etiological factor in fertilization failure and miscarriage in patients with endometriosis.

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