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In-Training Awards for Research

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Title: Response of immature and mature mouse cytoskeleton to endometriosis - Role of oxidative stress

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sharmar@ccf.org, Jeffrey Goldberg, MD, goldbej@ccf.org and Ashok Agarwal, Ph.D., HCLD, agarwaa@ccf.org. ¹Reproductive Research Center, Department of Obstetrics & Gynecology, Cleveland Clinic, Cleveland, Ohio, United States, 44195 and ²Department of Ob/Gyn, Suez Canal University Hospital, Ismailia, Egypt.

Objective: Mature and immature oocytes are differentiated by the presence of the first polar body. Oxidative stress is involved in the pathophysiology of endometriosis. The goal of our study was to examine the effect of peritoneal fluid from patients with endometriosis on the microtubule and chromosomal alterations in both mature and immature oocytes.

Design: Prospective *in vitro* study

Materials and Methods: 50 oocytes were divided into 2 groups according to the presence or absence of the polar body. Group I: 29 mature oocytes with polar body. Group II: 21 immature oocytes and no polar body. Both groups were incubated in peritoneal fluid of patients with endometriosis + HTF (50:50 vol./vol.) for one hour. Oocytes were fixed, and immunohistochemical staining was done to evaluate the alterations in the microtubules. Propidium iodide was used for chromosomal staining. Microtubules and chromosomes were examined by fluorescent and confocal microscopy. Modified scoring system was used (Choi et al. 2007). For microtubules a scores of 1 and 2 = normal; score 3 = slightly abnormal, and score 4 = missing. For the chromosomal alterations: Scores 1 and 2 = normal; score 3 = slightly abnormal and score 4 = totally abnormal.

Results: Significant damage in both microtubules and alterations in chromosomes were seen in immature oocytes compared to mature oocytes (see Table).

Conclusions: Spindle structure (microtubules and chromosomes) in immature oocytes is more susceptible to oxidative stress induced damage compared to mature oocytes. Mature oocytes appear to be more resistant to oxidative stress following exposure to peritoneal fluid. It is critical to minimize the exposure of immature oocytes to oxidative stress during *in vitro* maturation of the oocytes.

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