OVERCOMING ENDOMETRIOSIS-ASSOCIATED PREIMPLANTATION EMBRYO DEVELOPMENTAL ANOMALIES BY CULTURE

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ABSTRACT

Endometriosis, characterized by the localization and establishment of ectopic endometrial tissue, afflicts 10 to 15% of reproductive-aged women worldwide. Due to the anomalous substances secreted from these endometriotic lesions, symptoms manifest themselves as subfertility and abdominal pain. Abnormal preimplantation embryo development is predictably one cause of the decreased birth rate observed in women with endometriosis. Our laboratory hypothesizes that removing early stage embryos from a harmful endometriotic environment and placing them into an in vitro system will improve their overall quality and developmental potential. Using a surgical model of endometriosis in the rat (Endo), zygotes were collected and either cultured up to, or gestated to, developmental day 2 or day 4. Sham surgery and no-surgery rats were included as controls. Cellular fragmentation, nuclei number, and nuclear quality were assessed and compared between each experimental group using regression analysis. In the Endo rat model, increased embryonic stress has also been characterized by the elevated presence of active proteasomes and an upregulation of pro-apoptotic genes. Based on this observation, our lab decided to further characterize Endo, Sham, and No-Surgery Control embryo quality, at D2 or D4, by looking at the localization of ubiquitin c-terminal hydrolases L1 (UCHL1) and L3 (UCHL3), two deubiquitinating enzymes involved in the ubiquitin-proteasome system. It was concluded that developing Endo rat zygotes in an in vitro system does not improve quality, this characteristic manifesting itself on developmental D4.