OBJECTIVE: To compare operative and peri-operative outcomes between laparoscopic and robotic myomectomies.

DESIGN: A review of prospectively maintained data in 2:1 matched cases of 96 laparoscopic and 48 robotic myomectomies. The cases were matched for number and size of fibroids removed, and timing of post-operative ultrasound. Medical charts were abstracted for demographics, operative and peri-operative outcomes.

MATERIALS AND METHODS: Women over the age of 18 who underwent a laparoscopic or robotic myomectomy from July 2009 through December 2014.

RESULTS: The data was analyzed via Student t-test for continuous variables and Chi-square or Fischer's exact for categorical variables. A Spearman correlation was performed for conversion rate for complex cases in the robotic cohort. The number of exposed myometrial cells, increasing risk for development of uterine fibroids in adult females via expansion of the stem cells in the developing uterus. In addition to other genetic/epigenetic alterations, early expansion of myometrial stem cells may be a novel risk factor for fibroid tumorigenesis. Xenoestrogen-induced increase in stem cells could also be a contributing factor to the ethnic disparity in risk for this disease; as minority women are at higher risk of exposure to XEs. Further animal-human studies of this innovative concept will aid the design of preventative strategies for this clinically relevant tumor.

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EARLY LIFE EXPOSURE TO ESTROGEN-MIMICS INCREASE THE OCCURRENCE OF UTERINE FIBROIDS VIA EXPANSION OF MYOMETRIAL STEM CELL POPULATION. A. Mas, L. Elam, C. Walker, C. Simon, M. P. Diamond, W. Thompson, A. Al-Hendy. 1Department of Obstetrics and Gynecology, Georgia Regents University, Augusta, GA; 2Department of Obstetrics and Gynecology, Georgia Regents University, Augusta, TX; 3Fundacion Instituto Valenciano de Infertilidad IVI-Universidad de Valencia-INCLIVA, Paterna (Valencia), Spain; 4Department of Obstetrics and Gynecology, Morehouse School of Medicine, Atlanta, GA.

OBJECTIVE: Experimental animal studies have shown that exposure of target tissues to xenoestrogens (XEs) during sensitive periods of development can increase risk of disease in adult life, a process known as development reprogramming. Normal uterine myometrium is sensitive to ovarian hormones, making it a potential target for XEs. Developmental exposures to XEs have been shown to cause alterations the epigenetic programming of exposed myometrial cells, increasing risk for development of uterine fibroids. Our goal was to determine if exposure to XEs during critical periods of development altered the number and/or function of myometrial stem cells in exposed tissues, contributing to fibroid tumorigenesis.

DESIGN: Laboratory research studies using a murine model of a human disease.

MATERIALS AND METHODS: Eker rats (animal model for uterine fibroids) were exposed to XEs diethylstilbestrol (DES) or vehicle control (VEH) during postnatal days (PND) 10-12, and maintained until adulthood at 5 months of age. Myometrial cells were isolated from the uterine horns and cervix of adult Eker rats, and sorted by flow cytometry (FACS) using Stro1/CD44 myometrial stem cell markers. Additionally, human myometrium isolated from women without fibroids (MyoN) or women with fibroids (MyoF) was examined by immunohistochemistry (IHC) for Stro1/CD44 positive (stem) cells.

RESULTS: At 5 months of age, morphological and functional differences were observed in the uterus of DES versus VEH treated rats. Quantification of Stro1/CD44 myometrial stem cells by FACS revealed that the percentage of myometrial stem cells in cervix (44.8%) and horns (23.4%) from DES exposed animal was significantly higher than cervix (35.3%) and horns (11.6%) from VEH rats (p<0.05). Quantification of Stro1/CD44 human myometrial stem cells by IHC demonstrated that the percentage of Stro1/CD44 positive cells was significantly higher in MyoF versus MyoN (p<0.01).

CONCLUSIONS: These data suggest that early life exposure to XEs may promote development of uterine fibroids in adult females via expansion of the stem cells in the developing uterus. In addition to other genetic/epigenetic alterations, early expansion of myometrial stem cells may be a novel risk factor for fibroid tumorigenesis. Xenoestrogen-induced increase in stem cells could also be a contributing factor to the ethnic disparity in risk for this disease; as minority women are at higher risk of exposure to XEs. Further animal-human studies of this innovative concept will aid the design of preventative strategies for this clinically relevant tumor.