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Title:

OVARIAN RESERVE IS NOT COMPROMISED IN PATIENTS WITH INFLAMMATORY BOWEL DISEASE

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Background:
Advances in genome wide sequencing have identified new gene pathways associated with health or potentially leading to the development of disease. Given the immunological and inflammatory pathways that inflammatory bowel disease (IBD) and infertility have in common, we performed this study to evaluate whether a diagnosis of IBD was associated with ovarian physiological aging.

Objective:
The study sought to investigate whether a diagnosis of IBD is associated with ovarian physiological aging.

Materials and Methods:
This is a retrospective cohort study including 85 patients with IBD (Crohn's Disease (CD) n=39; Ulcerative Colitis (UC) n=46) who sought infertility consultation at a private, academic IVF center from 2010 to 2017. Subjects were identified from the site's electronic medical records by a natural language processing approach searching for key terms related to an IBD diagnosis. Patients without a record of Anti-Müllerian Hormone (AMH) and/or basal antral follicle count (BAFC) were excluded. Per every subject with IBD, 3 controls (matched by age and year of treatment) were selected at random from the electronic medical record database. The subjects with IBD and control group (n=255) were compared according to their ovarian reserve markers (AMH and BAFC). In addition, a sub-analysis segregated IBD patients by their specific disease subtype (CD vs. UC) and compared patients' age and ovarian reserve. Student's t-test, Pearson correlation and multivariate linear regression analyses were performed.

Result(s):
The IBD group and controls were similar in age (34.9 ± 4.6 vs. 34.7 ± 4.6 years, p = 0.7). In both groups, age was significantly correlated with a reduction in mean AMH level (p<0.0001), and this correlation was noted to be slightly stronger in the IBD group (r= -0.42 vs. -0.32). The markers of ovarian reserve were similar between the IBD group and controls (AMH levels 2.94 ± 3.99 vs. 2.99 ± 3.46, p=0.9, and BAFC 10.2 ± 7.5 vs. 10.8 ± 6.8, p = 0.58, respectively). Women with CD were significantly younger (33.6 ± 4.2 years) as compared to women with UC (36.0 ± 4.7 years), p = 0.015. However, IBD patients had similar mean AMH levels (3.19 ± 3.6 vs. 2.73 ± 4.32, p = 0.6) and mean BAFC (10.4 ± 9.6 vs.10.0 ± 5.34, p = 0.87), regardless of having CD or UC. After controlling for age, AMH levels were not significantly different between CD (β = -0.46, p=0.57) and UC patients (β= -0.23, p=0.92).

Conclusion(s):
By using big data and a systems-based approach, we can better understand the molecular basis of disease processes such as IBD and infertility. Patients can be reassured that although tubal disease is common, IBD is not associated with compromised ovarian reserve. Additionally, although the inflammatory pathways differ in CD and UC, these types of IBD do not differ in respect to effect on ovarian reserve. Future studies should examine the endometrial receptivity of patients with IBD, as well as the correlation between levels of inflammatory markers and effect on ovarian reserve.

Table 1:
Comparison of mean age, AMH and BAFC among IBD and age- and year of evaluation-matched control subjects (mean +/- SD, range in parentheses)

	IBD patients (n=85)	Controls (n=255)	P value
Age	34.9 +/- 4.6	34.7 +/- 4.6	0.70
AMH	2.94 +/- 3.99 (0.12-28.2)	2.99+/- 3.46 (0.13-34.0)	0.90
BAFC	10.2 +/- 7.5	10.8 +/- 6.8	0.58

Table 2:
Comparison of mean age, AMH and BAFC among IBD patients with ulcerative colitis vs. Crohn's disease (mean +/- SD, range in parentheses)

	Crohn's (n=39)	UC (n=46)	P value
Age	33.6 +/- 4.2 (24.5-43.3)	36.0 +/- 4.7 (24.7-43.5)	0.015
AMH	3.19 +/- 3.6 (0.16-14.7)	2.73 +/-4.32 (0.12-28.2)	0.60
BAFC	10.4 +/- 9.6 (1.0-	10.0 +/- 5.34 (4.0-	0.87

	42.0)	25.0)	

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References:

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