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Title:

DIFFERENTIAL CONTRIBUTIONS OF AGE AND BASAL FOLLICLE STIMULATIN HORMONE (FSH) LEVELS TO ODDS OF ANEUPLOIDY

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Objective:
High aneuploidy rates are often associated with poor oocyte and embryo quality, both of which decrease with age. As with aneuploidy, FSH levels also rise with age; however, no direct link has been demonstrated between FSH levels and aneuploidy. Our study takes advantage of a large cohort of retrospective pre-implantation genetic screening (PGS) data to clarify the respective contributions of FSH and age to aneuploidy.

Design:
Retrospective analysis of patients who underwent PGS from a large reproductive medical center

Materials and Methods:
Our analysis included patients with partners of normal karyotype, who underwent fresh in vitro fertilization (IVF) cycles in which ≥1 oocyte was retrieved, PGS was performed, and day 3 FSH levels were known for the cycle. The effects of patients' age and FSH levels (assessed both as a continuous variable and above/below a threshold of 13 mUI/mL) were correlated with aneuploidy status using generalized estimation equation (GEE) models.

Results:
A total of 462 patients with 2207 embryos were analyzed. Overall, patients with normal ploidy were younger (35.5 ±4.0 vs.38.1±4.4) and had a lower basal FSH level (7.56 ±3.6 vs. 8.1±3.5) compared to those with aneuploidy. Our study demonstrated that the odds of aneuploidy increased by 10% for each year of a woman's reproductive lifespan (OR=1.1, p<0.0001). We found no independent contribution of FSH levels to odds of aneuploidy, either when assessed as a continuous variable (p=0.75) or when considered above a threshold of 13 (p=0.45). However, we did observe that for women with FSH levels

above 13 mUI/mL, their odds of aneuploidy increased at a substantially higher rate (50%) for each additional year (OR=1.52, p<0.0001) of life.

Conclusions:

Our findings suggest that equivalent FSH levels should not be directly equated with egg quality in women of different age. This has significant implications for the management of infertility in younger women with elevated FSH levels. Also, these women might benefit from earlier treatment intervention and egg/embryo banking, given that their odds of aneuploidy rise more rapidly over time than women of the same age without elevated FSH levels.

Support:

None.

Table:

Factor	OR	p-value
Age	1.1	<0.0001
FSHMax	1.01	0.75
FSHMax>13	0.84	0.45
FSHMax>13:Age	1.52	<0.0001