HUMAN GROWTH HORMONE DOES NOT IMPROVE EUPLOIDY RATES PER OOCYTE RETRIEVED IN PATIENTS UNDERGOING IN VITRO FERTILIZATION WITH PREIMPLANTATION GENETIC TESTING FOR ANEUPLOIDY

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Background: The role of human growth hormone (hGH) in in vitro fertilization (IVF) has been evaluated with mixed results. Two small retrospective cohort studies suggest a trend toward higher numbers of euploid embryos when hGH supplementation is added to an IVF protocol. [1,2]

Objective: To determine if hGH improves euploidy rates per oocyte retrieved in the largest cohort study to date evaluating hGH's effect on euploidy.

Materials and Methods: A retrospective cohort study was performed at a university-affiliated private practice and included patients undergoing IVF with preimplantation genetic testing for aneuploidy (PGT-A) between January 2015 and March 2023. Exclusion criteria included cycles with non-autologous oocyte donation, thawing and fertilization of previously cryopreserved autologous oocytes, and embryos batched for PGT-A. Electronic medical records of patients were reviewed and extracted data included maternal age at cycle start; use and/or dose of hGH; number of oocytes retrieved, mature, and fertilized; number of embryos biopsied; and the outcome of each embryo biopsy. A subanalysis was performed to assess euploid rate per oocyte retrieved and per embryo biopsied with patients stratified by age. Multiple linear regression was performed to assess the impact of hGH dose on euploid rates. Low, medium, and high dose hGH was considered 2 IU, 26 IU, and 50 IU daily, respectively. Student's t-test and multiple linear regression were performed in Minitab v21 with $P<0.05$ considered significant.

Results: 1,558 unique patients completed 2,371 IVF with PGT-A cycles. hGH was administered in 244 cycles. Overall, patients taking hGH were older than patients not taking hGH (mean age 39.05 vs 37.3 years, $P<0.001$) and had fewer oocytes retrieved (9.98 vs 15.00 oocytes, $P<0.001$). There were no differences in maturity or fertilization rates among patients taking and not taking hGH.

Characteristic (Mean)	**Patients Receiving hGH N=244**	**Patients Not Receiving hGH N=2127**	**P value**
Age <35	**N=50**	**N=619**	
Euploid Embryos/Oocyte Retrieved	0.132	0.160	0.234
Euploid Embryos/Embryo Biopsied	0.383	0.513	0.014
Age 35.0-37.9	**N=32**	**N=474**	

Euploid Embryos/Oocyte Retrieved	0.130	0.147	0.632
Euploid Embryos/Embryo Biopsied	0.430	0.454	0.751
Age 38.0-40.9	**N=67**	**N=574**	
Euploid Embryos/Oocyte Retrieved	0.067	0.095	0.031
Euploid Embryos/Embryo Biopsied	0.290	0.327	0.477
Age > 41.0	**N=95**	**N=460**	
Euploid Embryos/Oocyte Retrieved	0.059	0.042	0.221
Euploid Embryos/Embryo Biopsied	0.195	0.172	0.544

Multiple linear regression was performed to account for low, medium, and high dosing of hGH and there was no significant impact of hGH dose on rate of euploid embryos per oocyte retrieved.

Conclusions: In the largest cohort study to date, there are no improvements in oocyte maturity, fertilization, and euploidy rates per oocyte retrieved or per embryo biopsied among patients taking hGH compared with those not taking hGH, across age groups. There is no role for hGH in IVF cycles with planned PGTA.

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References:

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