Repeat Dose of Gonadotropin-Releasing Hormone Agonist (GnRH-a) Trigger in Oocyte Donors

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BACKGROUND: The LH surge that is induced by GnRH-a trigger has a short half-life. To induce final oocyte adequate maturation double trigger GnRH-a with human chorionic gonadotropin is used that may cause ovarian hyperstimulation syndrome (OHSS) especially in high risk patients.

OBJECTIVE: To investigate whether repeat dose of GnRH-a trigger in 12 hours increases usable egg rate per cycle compared to a single dose of GnRH-a trigger in GnRH antagonist IVF-ICSI cycles in oocyte donors.

MATERIALS AND METHODS: A single center retrospective case-control study was conducted at New England Fertility Institute, Stamford, CT, US from 21st October 2021 to 26th January 2023. Two groups of the oocyte donors (n=184) were identified based on the single Lupron trigger (n=87) and repeat Lupron trigger (n=97) for the final oocyte maturation. There was no difference in age or mean AMH level between the groups (p=0.117 and p=0.167 respectively); In the first group, 87 donors underwent ovarian stimulation with starting dose of recombinant FSH 150-225IU with human menopausal gonadotropin 75IU and the dosage were adjusted according to blood work and ultrasound monitoring. After at least 1 follicle reached 14mm and/or estradiol level was >1000 ng/ml, antagonist 0.25mg initiated subcutaneously daily. When > 3 follicles reached the size of 18 mm, ovulation was triggered by single dose GnRH-a, 4mg subcutaneously. For the second group of donors (n=97) ovarian stimulation was done with the same protocol, but ovulation was induced with repeat dose of GnRH-a trigger, 4mg each 12 hours apart. The outcome measured were egg maturation rate, biopsy rate, PGS normal blastocyst rate. A Mann-Whitney U test was conducted to compare the number of mature eggs, biopsied embryos and PGS normal embryos among egg donors who received single and repeat doses of Lupron triggers.

RESULTS: Even though the egg maturation rate was higher in repeat dose of GnRH-a trigger group compared to a single GnRH-a trigger (85.8% and 80.6%), a Mann-Whitney U test revealed no statistically significant difference between the groups (Md = 20.5, n = 87) and (Md = 21, n = 97), U = 3716, z = - 1.27, p = 0.203. There was a higher rate (42.3% and 35.9%) and statistically significant higher number of biopsied embryos in repeat GnRH-a trigger group compared to a single GnRH-a trigger (Md = 11, n = 97) and (Md = 8, n = 87) U = 3417, z = - 2.111, p = 0.035. There was no statistically significant difference in the number of PGS normal embryos in repeat doses of Lupron trigger patients (Md = 11, n = 97) compared to single dose of Lupron trigger patients (Md = 8, n = 87) U = 3417, z = - 2.111, p = 0.035. No ovarian hyperstimulation syndrome was reported in either group.

CONCLUSIONS: Repeat GnRH-a trigger can be administered for ovulation induction to extend the effect of LH surge to induce the adequate egg maturation in oocyte donors while avoiding chorionic gonadotropin for dual trigger effect especially in patients with high risk of OHSS. Further studies are required to determine the effectiveness of repeat dose of GnRH-a triggers on final oocyte maturation and pregnancy rate as well.

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