

### Introduction:

Agonist only trigger has been advised to tackle OHSS risk in high responding patients underwent COH with GnRH antagonist co-treatment. However, in many times increased difficulties are experienced during the procedure of ovum pick-ups. Previous reviews only investigate the differences between agonist only trigger and hCG triggers. Thus we aim to study the effect of agonist trigger and our dual trigger protocol on the follicular and embryonic development outcome first and will also probe into the pregnancy outcome later.

### Materials and Methods:

Database from ART program in our center was reviewed. Total 2454 starting cycles during the period between Jan 2014 and Aug 2019 were investigated initially. There were 1760 antagonist cycles with induction period of over 5 days. 269 cycles with peak E2 level over 4000 pg/ml were enrolled for the study. 66 cycles were triggered by Decapeptyl 0.2 mg only and 193 cycles by both Decapeptyl and Ovidrel 250 ug. The demographic characteristics, clinical variables, follicular maturation variables and embryonic developmental parameters were compared statistically between these two groups. Statistics (Mann-Whitney U test and Chi-square test) were carried out by SPSS-PC ver. 22.0 with  $p < 0.05$  as statistical significance.

### Results:

The patients we applied in agonist only vs dual trigger group were relatively younger (34.2 vs 35.3y/o), with higher AMH (6.9 vs 6.2ng/ml), consumed lesser gonadotropin but achieved higher number of developing follicles 17.9 vs 14.8  $\geq 14$ mm; 29.0 vs 22.8  $\geq 10$ mm), serum E2 level (5880 vs 5491 pg/ml),

**Table-1. The general characteristics and baseline clinical parameters between agonist trigger and dual trigger in high responder ART cycle**

	Agonist trigger (N=66)	Dual trigger (n=193)
female age	34.2±3.9	35.3±3.8*
body BMI index	21.9±2.6	22.5±3.6
AMH	6.9±2.8	6.2±4.2*
FSH dosage(IU)	2241.5±800.2	2923.0±1066.0*
LH dosage(IU)	637.5±497.2	842.9±592.4*
induce days	10.1±1.1	10.4±1.1
total $\geq 14$ mm follicle no.	17.9±5.4	14.8±5.7*
total $\geq 10$ mm follicle no.	29.0±7.6	22.8±8.3*
Baseline LH	5.9±6.3	4.7±2.5
E2 at triggering day	5880.8±1557.9	5491.3±1638.6*
LH at triggering day	1.8±1.3	1.0±0.8*
Progesterone at triggering day	1.5±0.7	1.3±0.6*

**Table-2. The ovarian response and embryonic outcome in high responding ART cycles**

	Agonist trigger (N=66)	Dual trigger (n=193)
oocyte retrieval no.	25.0±8.4	22.4±10.5*
mature oocyte no.	20.5±8.3	17.4±7.7*
D3 good embryos no.	6.6±4.3	6.4±4.6
D5 good BC no.	8.0±5.3	7.0±5.5
Oocyte retrieval rate	86.2%	98.1%*
Oocyte maturation rate	81.9%	77.6%*
Fertilization rate	74.2%	73.2%*
D3 good embryos rate	33.6%	36.5%
BC rate	58.0%	57.0%
Occurrence of OHSS	0%	5.2%

oocyte retrieval rate: total oocyte retrieval numbers / total  $\geq 10$  mm follicle numbers; maturation rate: total maturation oocyte numbers / total oocyte retrieval numbers; Fertilization rate: fertilization numbers / total oocyte retrieval numbers; D3 good embryos: Day 3 embryos 7-8 cells Grade 1 or 2 / all cleavage embryos numbers; BC rate: total blastocyst numbers / cleavage embryos without fresh D2/3 ET.

**Table-3. The ovarian response and embryonic outcome in high responder ART cycles with P4 $>1.5$  ng/ml**

	Agonist trigger (N=27)	Dual trigger (n=59)
D3 good embryos no.	6.6±4.3	6.7±5.7
D5 good BC no.	6.1±4.2	6.8±5.5
Oocyte retrieval rate per cycle	84.2±26.5%	97.2±26.7%*
maturation rate per cycle	83.1±16.4%	79.7±13.9%
D3 good embryos rate per cycle	34.3±15.6%	34.8±20.4%
BC rate per cycle	52.7±17.1%	53.2±24.4%
Occurrence of OHSS	0%	10.2%

**Table-4. The ovarian response and follicular outcome in high responder ART cycles with LH $\geq 1.0$  mIU/ml**

	Agonist trigger (N=47)	Dual trigger (n=69)
D3 good embryos no.	6.1±4.0	5.3±4.2
D5 good BC no.	7.3±4.9	6.9±5.4
Oocyte retrieval rate per cycle	88.5±22.7%	91.7±23.2%
maturation rate per cycle	81.6±17.2%	79.7±17.1%
D3 good embryos rate per cycle	32.0±15.0%	35.6±20.5%
BC rate per cycle	53.7±18.0%	56.9±23.1%
Occurrence of OHSS	0%	4.3%

LH (1.8 vs 1.0 mIU/ml) and P4 (1.5 vs 1.3 ng/ml) level as well as higher retrieved number of total oocytes (25.0 vs 22.4) and mature oocytes (20.5 vs 17.4). But the oocyte retrieval rate was significantly lower (86.2% vs 98.1%). However, the oocyte maturation rates, fertilization rates, good D3 embryos rates and good BC rates were all comparable in both groups. And the final utilizable number of good embryos were also very similar in numbers without statistical significant differences (D3 6.6 vs 6.1; D5 8 vs 7). The occurrence of OHSS was none in the agonist only group but 5.2% in the dual trigger group. Further analysis of the data revealed significantly reduced oocyte retrieval rates in agonist only group while trigger day  $P4 > 1.5$  ng/ml (but not in those with  $P4 \leq 1.5$ ) and while trigger day  $LH < 1.0$  mIU/ml (but not in those with  $LH \geq 1.0$ )

### Conclusion:

Agonist only trigger could effectively prevent the occurrence of OHSS at the cost of significantly reduced oocytes retrieval rates. However the embryonic development parameters and the final utilizable numbers of good embryos were not compromised. The final pregnancy outcome by first FET cycle and the cumulative finals were also comparable (not shown in this report).

### Reference:

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