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Role of measuring serum LH levels 12 hours post agonist trigger and administration of rescue HCG trigger

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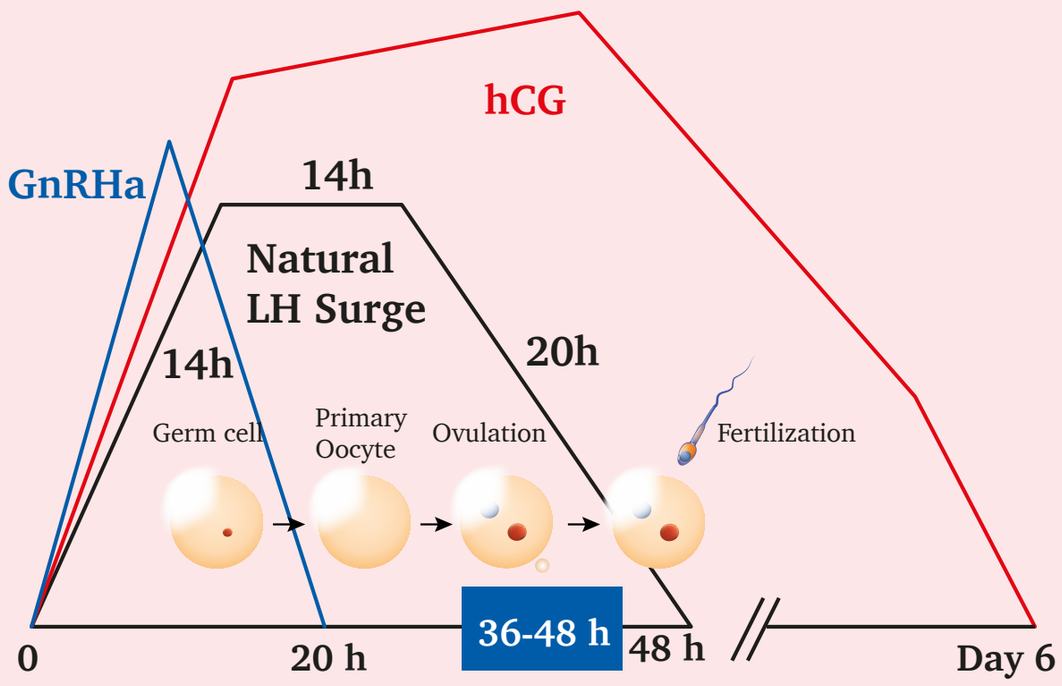
Study question – Does measurement of serum LH levels 12 hours after agonist trigger and administration of rescue HCG trigger (if LH level is below 50 IU/L) improve oocyte recovery rate and maturity rate ?

Summary answer – This kind of approach does not significantly improve oocyte recovery rate and maturity rate.

What is known already – With advent of antagonist protocol in IVF stimulation it has become common to administer agonist trigger for final oocyte maturation to decrease the risk of OHSS. Even though pregnancy rates are lower and miscarriage rates are higher with fresh embryo transfer in agonist triggered cycles, not much has been published about efficacy of agonist trigger in terms of oocyte recovery rate(eggs retrieved/mature size follicles on day of trigger administration) and maturity rate (metaphase II/eggs retrieved). There are few studies reporting lower oocyte recovery rate with agonist trigger if serum LH level <15IU/L 12 hours post trigger administration.



Study design - Retrospective study of 100 patients undergoing IVF-ICSI freeze all cycles with own eggs on flexible antagonist protocol at our centre.

Patient Characteristics	GROUP 1	GROUP 2 (s. LH measured)	P value
Patients (No.)	50	50	
Age	30.8 +/- 4.5	28.5 +/- 3.8	0.04
BMI	25.2 +/- 5.5	24.8 +/-6.2	0.33
AMH	5.7 +/- 5.3	6.7 +/- 4.8	0.16
Gn dose	216 +/- 54	186 +/- 46.6	0.0045
Stimulation days	9.1 +/- 1	9.02 +/- 1.15	0.122
Follicles	20.5 +/-10.3	25.7 +/- 10.7	0.009
Estradiol	3039 +/- 1768	2674 +/- 1769	0.34

Outcome	GROUP 1	GROUP 2 (s. LH measured)	P value
Eggs retrieved	21 +/- 10.05	20.06 +/- 9.4	0.15
Oocyte recovery rate	87% +/- 29.4	83.9% +/-31.12%	0.26
MII oocytes	12.5 +/- 7.4	14.08 +/- 7.19	0.18
Maturity rate	71% +/- 17.2	72.3% +/- 30.7	0.46
Fertilisation rate	84.1% +/- 18.7	90% +/- 43.6%	0.19
Grade 1 embryos formed	4.6 +/- 2.2	4.5 +/-2.4	0.37

	Group 2A <15	Group 2B 15-30	Group 2C 30-50	Group 2D >50
Oocyte recovery rate		59.50%	90.30%	90.60%

Main results and the role of chance – On an average 20 eggs were retrieved per patient in group 1 and 21 eggs were per patient in group 2 (p value – 0.15). There was no significant difference in oocyte recovery rate (oocytes retrieved/follicles > 14 mm on day of trigger administration) between the two groups. (87% in group 1 and 83.9% in group 2, p value - 0.26). There was only one patient with empty follicle syndrome in group 1 and none in group 2. Oocyte maturity rate (metaphase II / eggs retrieved) was also similar between both groups. (Group 1 – 71%, Group 2 – 72.3%, p value - 0.46). No patient had LH levels <15IU/L in our study, 2 patients (4%) had LH level measuring 15-30 IU/L and 10 patients(20%) had LH level measuring 30-50 IU/L. In group 2B (LH <30IU/L), oocyte retrieval rate was lower than remaining 2 groups (Group 2B-59.5%, Group 2C- 90.3%, Group 2D- 90.6%). We had no incidence of OHSS in any of the patients.

Limitations, reasons for caution – Retrospective nature of the study and participants selected over 2 different time spans. Administration of HCG may pose a patient at risk of OHSS. Majority of the participants were hyper-responders undergoing all freeze cycles to avoid risk of OHSS(results cannot be extrapolated to all).

Wider implications of the findings – Measuring LH levels 12 hours post agonist trigger and administration of rescue HCG trigger does not improve oocyte recovery rates even if LH level was<30 IU/L. Incidence of LH level < 30 IU/L (that is the group with poor oocyte recovery rate) was only 4% in our study. This kind of approach will just add to patient inconvenience and cost by adding one more blood draw, one more visit and one more injection and pose them at risk of OHSS even though we had none in this study.

Refrences - 1. Chen et al, Circulating luteinizing hormone level after triggering oocyte maturation with GnRH agonist may predict oocyte yield in flexible GnRH antagonist protocol, Human Reproduction, Volume 27, Issue 5, 1 May 2012

2. Shapiro et al, Efficacy of induced luteinizing hormone surge after "trigger" with gonadotropin-releasing hormone agonist, Fertility and Sterility, Volume 95, Issue 2, Februay 2012

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