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Title:

TO BOOST OR NOT TO BOOST: DOES ADMINISTRATION OF RESCUE HCG IMPROVE OUTCOMES IN POOR RESPONDERS WITH LOW POST-TRIGGER VALUES?

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Objective:

Ovarian hyperstimulation syndrome (OHSS) is a potential complication of ART that can be concerning to patients and a difficult therapeutic challenge to physicians. One preventative measure to minimize the risk of OHSS is to lower the dose of hCG prior to retrieval. However, there is a threshold under which final maturation of the cumulus cell-oocyte complex might not occur. Several surrogate markers may be used to determine appropriate response to trigger, including serum progesterone (P4) or hCG on day after trigger administration. When these markers suggest an inadequate response, some clinicians supplement patients with booster or "rescue" hCG. However, there is limited data on the effectiveness of rescue hCG in improving oocyte yield. Our goal was to compare outcomes between patients who did or did not receive rescue hCG in a population of patients with an inadequate response to trigger.

Design:

Retrospective cohort analysis

Materials and Methods:

Our study included patients at a single academic center who underwent controlled ovarian hyperstimulation and met criteria for rescue hCG (P4 <1.0ng/dl or hCG level <40mIU/mL on day after trigger) from 2004 to 2019. Patients were separated into 2 groups based on administration of supplemental hCG (Case Group: hCG trigger 36 hours and rescue hCG 12-24 hours prior to retrieval; Control Group: hCG trigger 36 hours prior to oocyte retrieval). Patients were excluded if leuprolide acetate was used for trigger, either as a dual trigger or as leuprolide alone. A sub-analysis of poor responders to COH (Bolognia criteria: age >40, antral follicle count ≤ 10 follicles total, or AMH ≤ 1ng/ml) was performed. Primary outcome was the number of oocytes retrieved. Data were analyzed using students t-tests, chi square tests, and a multivariate logistic regression analysis, with $p<0.05$ considered significant.

Results:

A total of 732 patients who underwent 833 cycles were assessed. The case group consisted of 397 cycles in which both 36 hour and subsequent rescue hCG prior to retrieval were used. The control group consisted of 436 cycles in which a single hCG trigger 36 hours prior to retrieval was used. There were significant differences in age, AMH, BMI, the number of follicles ≥14mm visualized on day of trigger, estradiol, and progesterone on day of trigger between groups. After adjusting for the confounding variables, use of rescue hCG did not predict number of eggs retrieved ($\beta = 0.05$, $p = 0.83$). In our sub-analysis of poor responders that controlled for the same confounders, we found that the use of rescue hCG was significantly correlated with the number of eggs retrieved ($\beta = 0.53$, $p = 0.03$).

Conclusion:

In the largest study to date evaluating the use of rescue hCG to improve oocyte yield, our data suggest an improvement in number of eggs retrieved in a subset of patients. While we did not demonstrate clinical advantage to using rescue hCG in the general study group, we found that a subset of poor responder patients benefited from supplemental hCG. Future studies would benefit from validating a threshold level for peak progesterone or bHCG that customizes the use of rescue hCG.