HIGH-QUALITY BLASTOCYST (HQB) FORMATION FOLLOWING DAY 3 (D3) OR DAY 5 (D5) ASSISTED HATCHING (AH)

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Background:

There has been a nationwide increase in the use of preimplantation genetic testing for aneuploidy (PGT-A) There is also no consensus whether assisted hatching (AH) at cleavage (D3) or blastocyst stage (D5) is preferred. Clinically, one way to compare D3 and D5 AH is to look at high quality blastocyst formation.

Objective:

To investigate whether D3 or D5 assisted hatching lead to similar high-quality blastocyst (HQB) formation rates.

Materials and Methods:

Design: Retrospective cohort.

Setting: Academic fertility center.

Patients: 16,148 oocytes retrieved from 856 patients.

Intervention: D3 vs. D5 AH.

Outcomes: Day 5 (D5) and total [D5 and day 6 (D6)] HQB [absolute number and conversion rates (% of 2PNs)].

Statistics: Parametric and non-parametric tests were used accordingly. Generalized estimating equations (GEE) and linear regression were used for outcomes to account for multiple embryos per patient and adjust for maternal age, infertility diagnosis, and fertilization method.

Results:

There were similar number of oocytes retrieved per retrieval for D3 vs. D5 AH [Mean±SD 13.6±7.0 vs. 15.4±9.1 (p=0.065)]. Within both groups, a majority of oocytes were fertilized with ICSI (D3 vs D5: 99.5% vs. 94.2%, p<0.001), leading to a similar number of 2PNs per retrieval (Mean±SD: 8.5±4.9 vs. 9.3±6.4, p=0.484, for D3 vs. D5 AH, respectively).

Before adjustment, the number of D5 HQB and composite D5 and D6 HQB were similar in D3 vs. D5 AH [Mean±SD: Total # D5 HQB: 3.0±2.8 vs. 3.5±3.3, p=0.3; Total # D5 & D6 HQB: 4.5±3.3 vs. 3.5±3.3, p=0.1]. Their conversion rates (% of 2PNs) were also similar between the D3 and D5 AH groups (HQB Rate±SD:

35.8±26.5 vs. 37.4±29.2, p=0.8). The analysis was repeated for the composite of D5 and D6 blastocysts. When looking at the HQB conversion rate for D3 vs D5 AH of the composite D5 and D6 blastocysts, there were no significant differences between the groups (HQB Rate±SD: 53.6±25.3 vs. 56.4±26.2, p=0.3]. After adjustment for maternal age, infertility diagnosis, and fertilization method, there were no significant differences between D3 and D5 AH groups.

Conclusions:

There were no significant differences in the absolute number and conversion rates of HQB whether assisted hatching was performed on day 3 or day 5.

Nationally, clinics are shifting towards increasing PGT-A testing, resulting in more embryologic lab procedures such as assisted hatching. This retrospective study shows there are no differences in fertilization or culture outcomes when comparing Day 3 to Day 5 AH, these findings will aid in developing universal embryology protocols.

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