

Journal of Sexual Health and Reproductive Medicine

The Transfers of a Day 3 Embryo Obtained from Women with Severe Diminished Oocyte Reserve with an Even Number of Blastomeres has A 5-Fold Greater Chance of Resulting in a Live Baby Compared to Cleavage Stage Embryos with an Uneven Number of Blastomeres

Jerome H Check^{1*}, Donna Summer MS², Danya Howarth MS², Michael Sobel DO² and Kathy Hallahan RN²

¹Cooper Institute for Reproductive Hormonal Disorders, Mt Laurel, NJ, USA

²Department of Obstetrics/Gynecology, Division Head of Reproductive Endocrinology and Infertility at Cooper Medical School of Rowan University Camden, NJ, USA

***Corresponding author**

Jerome H Check, MD, Ph D, Cooper Medical School of Rowan University, Camden, NJ, USA.

Received: September 11, 2026; **Accepted:** September 21, 2026; **Published:** September 28, 2026

ABSTRACT

A low level of blastomeres in a day 3 cleavage staged embryo is associated with lower live delivered pregnancy rates (LDPRs) compared to embryos with more blastomeres. The study presented here evaluated whether embryos with an odd number of blastomeres with a greater number of cells is less likely to lead to a live delivery than embryos with an even number of blastomeres. For the study, the women had marked diminished oocyte reserve (DOR) so that only 1 embryo was transferred on day 3. The LDPRs for woman with embryos that had 5, 7, 9 or 11 blastomeres was 2.4% per transfer vs 14.9%, for the women with 6, 8, 10, or 12 blastomeres. The patients were aged < 39 years. An embryo with an odd number of blastomeres is far less likely to achieve a live delivery compared to an even number of blastomeres in women < age 39 with marked DOR.

Keywords: IVF-ET, Diminished Oocyte Reserve, Single Embryo Transfer, Number of Blastomeres, Cleavage Stage Embryos

Introduction

A previous study evaluating the chance of a live delivery following the transfer of a single day 3 cleavage stage embryo obtained from women with marked diminished oocyte reserve (DOR) found the following live delivered pregnancy rates (LDPRs) following single embryo transfer: 4-cell 3.8%, 5-cell 9.5%, 6-cell 31.0%, 7-cell 25%, 8-cell 36.4% [1]. These data were published in 2007. The power was insufficient to show that a 7-cell embryo was slightly less likely to implant than a 6 or 8 cell embryo. The difference may have been fortuitous.

Over the years, anecdotally, it seemed that cleavage stage embryos with an odd number of blastomeres were less likely to result in live deliveries than those with an even number of blastomeres. The objective of this study was to evaluate in a larger data set and in a more modern era of embryology to compare LDPRs with embryos that had an odd number of

blastomeres to cleavage stage embryos with an even number of blastomeres.

Materials and Methods

A more recent 5-year retrospective study ending in 2025 was included identifying a group of patients whose egg reserve was so low that only 1 oocyte was retrieved and only 1 embryo developed. Based on very poor results with a 4-cell embryo, we compared the LDPRs in this study having 6,8, 10, or 12 cell embryos transferred vs a 5,7,9, or 11 cell embryos.

The oocyte stimulation technique is known as the FSH receptor up-regulation technique [2-4]. All transfers used fresh embryos from the cycle of IVF-ET. The women were < age 39.

Results

There were 42 transfers with an odd number of blastomeres and only 1 had a live delivery (LDPR of 2.4% per transfer). In contrast there were 17 live babies born from 114 transfers with day 3 embryos with an even number of blastomeres (LDPR of 14.9%) Fisher's exact test found $P < 0.05$.

Citation: Jerome H Check, Donna Summer MS, Danya Howarth MS, Michael Sobel DO, Kathy Hallahan RN. The Transfers of a Day 3 Embryo Obtained from Women with Severe Diminished Oocyte Reserve with an Even Number of Blastomeres has A 5-Fold Greater Chance of Resulting in a Live Baby Compared to Cleavage Stage Embryos with an Uneven Number of Blastomeres. *J Sex Health Reprod Med*. 2026. 2(3): 1-2. DOI: doi.org/10.61440/JSHRM.2026.v2.49

Fifteen of the 42 transfers had embryos with odd numbers of cells with only 5 blastomeres. If we just evaluate a subset of 7, 9, and 11 blastomeres, the LDPR would be 1/27 (3.7%). If one compares 8 cells (13/80-16.3%) compared to 10 and 12 cells, there were 4 live deliveries in 20 day 3 transfers (20.0%) of embryos reaching 10 or 12 cells. This study does not support a concept held by some other infertility specialist that rapidly growing embryos are inferior to 8 cell embryos, at least with an even number of blastomeres. There were no morulas so we cannot say whether cleavage that fast may be detrimental.

Discussion

This study of IVF-ET from women with marked DOR supports the suspicion that embryos with an even number of blastomeres have a much better chance of resulting in a live delivery than embryos with an odd number of blastomeres. In contrast to other infertility specialists who would usually advise the patient with severe DOR that her chance of live delivery following IVF-ET is quite low (and thus should consider donor oocytes) we found that at least when using the FSH receptor up-regulation technique that the LDPRs for women of this age group, the transfer of embryos with an even number of blastomeres is comparable to success rates or just slightly lower than expected for single embryo transfers in women with normal egg reserve.

These embryos have shown to result in live deliveries after cryopreservation with deferred transfer as evidenced by a woman in total menopause who was able to make a natural follicle using the FSH receptor up regulation technique who had 3 babies from frozen thawed embryos but the last one from an embryo cryopreserved more than 20 years before [4].

References

1. Check JH, Summers-Chase D, Yuan W, Horwath D, Wilson C. Effect of embryo quality on pregnancy outcome following single embryo transfer in women with a diminished egg reserve. *Fertil Steril*. 2007. 87: 749-756.
2. Check JH. A follicle stimulating hormone (FSH) receptor up-regulation technique as a method for follicular recruitment for in vitro fertilization-embryo transfer in women with diminished oocyte review. Ed. Leon V. Berhardt; In: *Advances in Medicine and Biology*, Nova Science Publishers, Inc., Hauppauge, NY, 2022. 195: 119-137.
3. Check JH, Covolesky S, DiAntonio AA Detailed Description of the FSH Receptor up Regulation Technique Employed to Develop Metaphase II Oocytes for in Vitro Fertilization Embryo Transfer in Women with Extremely Low Egg Reserve who had Successful Pregnancies. *J Sex Health Reprod Med*. 2026. 2: 1-7.
4. Srivastava P, Srivastava M. Check JH. Protocol Details and Outcome Analysis of 5 Years of Continuous Infertility Treatment in A Patient with Premature Ovarian Insufficiency/ Failure and Complex Crohn's Disease Utilizing Her Own Oocytes and outcome of 3 pregnancies. *J Sex Health Reprod Med*. 2026. 2: 1-6.