

2. Harriott MM, Lilly EA, Rodriguez TE, Fidel PL Jr, Noverr MC. *Candida albicans* forms biofilms on the vaginal mucosa. *Microbiology* 2010;156:3635–44.

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In women with transplantable euploid blastocysts, age does not affect transplant potential



TO THE EDITORS: The published study by Irani et al¹ entitled “Does maternal age at retrieval influence the implantation potential of euploid blastocysts?” was well designed. However, the grouping of morphological ratings may have some of the following issues: 2BC, 2CB, and 2CC were inconsistent in the *Methods* and abstract and lack the grouping of morphological ratings, such as AC, CA, and 1-2AA. More importantly, placing AB and BA in the same group may be controversial.

According to Nazem et al,² blastocysts with an inner cell mass grade of A had a greater odds of ongoing pregnancy/live birth (odds ratio, 1.5; 99% confidence interval, 1.1–2.0) and clinical pregnancy (odds ratio, 1.4; 99% confidence interval, 1.1–1.9) compared with B.

We further analyzed the trophectoderm grade of A and B in this paper of Nazem et al² and found no statistically significant difference in any of the results between the 2 grades ($P > .05$; SPSS version 20.0). The abovementioned points indicate that it may be unreasonable to include AB and BA in the same group.

This may explain why the implantation rates of the excellent- and good-quality groups were not significantly different according to the grouping method of Irani et al¹, possibly because of the relatively small number of cycles in which excellent-quality blastocysts were transferred, as suggested by Irani et al.

With this in mind, a preliminary analysis including 94 frozen-thawed cycles from our own center was performed for verification. When grouping blastocyst morphological ratings according to the method of Irani et al,¹ we reached the same conclusion reported in their paper. However, after changing the grouping strategy, AB and AA were grouped together ($n = 37$), while BA and BB were grouped together ($n = 57$). A statistically significant difference in implantation rates was found between the 2 groups (75.7% vs 50.9%; $P = .016$).

This suggests that changes in morphological grouping strategies can lead to different results, and this may further affect the distribution of embryo quality across age groups. More importantly, AB may be a better choice for transplantation than BA, especially if no AA is available for transplantation. Although this remains to be verified, it may have a positive effect on improving the quality of the assisted reproductive cycle.

We hope that Irani and colleagues, as well as researchers at other centers with large data, could consider the previously

mentioned issues and further verify the effect of expansion grade on pregnancy outcomes proposed by Nazem et al.²

In addition, Irani et al¹ concluded that differences in spontaneous abortion at different ages were not statistically significant, but older women (>40 years) still showed an increasing trend that should not be ignored. In addition, euploid embryo transfer can help older women achieve live birth rates that are similar to those of younger women; however, this does not mean that their pregnancy qualities are comparable. Other pregnancy outcomes for older women, such as preterm birth and low birthweight, should also be assessed.

Finally, the study included only those cycles from women with surviving euploid embryos for transplantation after biopsy and freeze-thawing,¹ which limits the study population. Therefore, we believe that the conclusion should be that age does not affect the implantation potential of the embryo among women with a transplantable euploid blastocyst. ■

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REFERENCES

1. Irani M, Zaninovic N, Rosenwaks Z, Xu K. Does maternal age at retrieval influence the implantation potential of euploid blastocysts? *Am J Obstet Gynecol* 2018;220:379.e1–7.
2. Nazem TG, Sekhon L, Lee JA, et al. The correlation between morphology and implantation of euploid human blastocysts. *Reprod Biomed Online* 2019;38:169–76.

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REPLY



We appreciate Drs Y. Guo, S. Guo, and Zhang for their interest in our work. After studying the role of blastocyst morphology in selecting among euploid embryos, we have demonstrated

that morphological grading and specifically inner cell mass and trophectoderm grade influence the ongoing pregnancy rates of euploid embryos, while the degree of blastocoel expansion does not correlate with outcomes.¹ Most importantly, after controlling for confounding factors, the inner cell mass grade was the best predictor of euploid blastocyst viability.¹ We have also shown that the rate of blastocyst development affects the implantation potential of similarly graded euploid blastocysts.²

Given these findings, it would be ideal to separate AB and BA embryos into 2 different groups and not include them with AA or BB groups. However, we do not believe that AB and AA embryos should be included in the same group because AB embryos were associated with a significantly lower live birth rate (LBR) compared with the AA group (61.7% vs 78.8%, $P = .03$).

In addition, the current study showed that excellent-quality blastocysts are associated with a significantly higher LBR and a trend toward a higher implantation rate compared with good-quality blastocysts (Table 2). Furthermore, there were only 11 cycles in which BA embryos were transferred, leading to an implantation rate of 90.9% and an LBR of 81.8%. Therefore, the current embryo grouping certainly did not affect the primary outcome of the study or the difference in LBRs between groups of different blastocyst grades. Of note, we did not have embryos of grades AC, CA, or 1-2AA within the study cohort.

The aim of the current paper³ was to determine whether maternal age at retrieval influences the LBRs of euploid embryos. While we agree that we included only cycles with at least 1 euploid embryo that survived the biopsy/freeze/thaw process, the survival rate of these embryos is >98% in our laboratory, regardless of a woman's age.

We have also shown in Table 1 that the number of euploid embryos decreases with age, and we adjusted for this factor when we compared the outcomes between the 5 age groups.

Embryo survival should be taken into account in centers where there is a significant difference in embryo biopsy/freeze/thaw survival rates between women in different age groups.

The findings of this study are reassuring and confirm that maternal age at retrieval does not affect the LBR of a euploid embryo.³ However, we concur that further studies are required to investigate whether a woman's age at retrieval influences perinatal outcomes.

In conclusion, blastocyst grading and development rate, but not maternal age at retrieval, influence the viability of euploid embryos.¹⁻³ ■

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REFERENCES

1. Irani M, Reichman D, Robles A, et al. Morphologic grading of euploid blastocysts influences implantation and ongoing pregnancy rates. *Fertil Steril* 2017;107:664–70.
2. Irani M, O'Neill C, Palermo GD, et al. Blastocyst development rate influences implantation and live birth rates of similarly graded euploid blastocysts. *Fertil Steril* 2018;110:95–102.e1.
3. Irani M, Zaninovic N, Rosenwaks Z, Xu K. Does maternal age at retrieval influence the implantation potential of euploid blastocysts? *Am J Obstet Gynecol* 2019;220:379.e1–7.

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