The evaluation of Well of the Well dish by using human embryo culture

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[Objective] In order to optimize the embryo culture environment, we have established a culture system capable of retaining a low oxygen level by appropriate incubator selection, use of time-lapse equipment and revision of culture medium. For further improvement of the system for retaining continuous culture in a low-oxygen environment, we focused on the Well of the well culture dish (hereinafter referred to as WOW), which was expected to combine the benefits of individual embryo management and group culture, and reported that its use had some positive effects on embryo development. In this study, we assessed whether the use of continuous culture system using WOW in clinical practice was effective in improving the embryo development rate. [Methods] We assessed 1702 embryos in 663 cycles cultured as single embryos in 15 μl drop culture at our clinic between June 2014 and September 2014 (drop group) and 2370 embryos in 837 cycles continuously cultured using WOW at our clinic between September 2014 and December 2014 (WOW group). Since WOW was introduced into clinical practice at the middle of September 2014, we selected the 4 months before and after its introduction as the study period. Fertilized oocytes were cultured in a non-humidifying incubator from Day 1 to Day 7, and the rate of good embryos on Day 3 was compared between the two groups. Morphology of the blastocysts was assessed according to Gardner's classification, and blastocyst formation rate on Days 5-7 and good blastocyst formation rate on Day 5 were calculated and compared between the two groups. [Results] The good embryo rates on Day 3 in the drop group and the WOW group were 19.6% and 20.7%, respectively. The blastocyst formation rate on Days 5-7 in the WOW group was 55.2%, which was significantly higher than 51.3% in the drop group ($p<0.01$). Moreover, the good blastocyst formation rate on Day 5 in the WOW group was 28.6%, which was significantly higher than 24.7% in the drop group ($p<0.05$). [Discussion] The results demonstrated the improved culture performance of the WOW group compared to the drop group in terms of blastocyst formation rate and good blastocyst formation rate. This suggests that the use of the continuous culture system using WOW in clinical practice improved the development rate. The shape of WOW and group culture may have contributed to the improved culture performance, so we will continue our study for further optimization of these factors.