

# Vitrification of human blastocysts with the Hemi-Straw carrier: application of assisted hatching after thawing

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**BACKGROUND:** The present study was undertaken to examine the usefulness of both vitrification and assisted hatching (AH) on blastocysts that originate from embryos showing different qualities during their cleavage stage. **METHODS:** A total of 281 blastocysts were vitrified (93 vitrification–warming cycles) in a mixture of ethylene glycol–dimethylsulphoxide–Ficoll and sucrose using the Hemi-Straw (HS) carrier system. After warming, AH using the partial dissection technique was performed in 36 cycles. **RESULTS:** After warming and culture for 24 h, a total of 168 blastocysts (60%) was suitable for embryo transfers and a total of 25 ongoing pregnancies (27%) was obtained. Forty-nine transfers of 96 no-AH blastocysts and 36 transfers of 72 AH blastocysts resulted in an implantation rate of 13 and 22% respectively ( $P < 0.05$ ). The percentage of transfers with at least one hatching blastocyst was significantly higher after application of AH (69 versus 33%) ( $P < 0.001$ ). In all, 73 and 38% of blastocysts showing respectively optimal and non-optimal embryo development during the early stage were available for transfer ( $P < 0.001$ ). Consequently, implantation rates of 19 and 6% were obtained after transfers of blastocysts showing respectively optimal and poor embryo development. **CONCLUSIONS:** Artificial opening of the zona pellucida after warming of vitrified blastocysts significantly improved the rate of transfers with hatched blastocysts and the implantation and pregnancy rates. The percentage of blastocysts that survived the HS vitrification procedure and were available for embryo transfer is related to their previous developmental quality.

*Key words:* assisted hatching/cryopreservation/embryo quality/human blastocyst/vitrification

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