VITRIFICATION OF PARTHENOGENETICALLY ACTIVATED PORCINE EMBRYOS

RONG LI1, JUAN LI1, YING LIU1, PETER M. KRAGH2, POUL HYTTLE2, HENRIK CALLESEN1
1Dpt. Genetics & Biotech., Faculty of Agricultural Sciences, Aarhus University, Denmark
2Dpt. Animal & Vet. Basic Sciences, Faculty of Life Science, University of Copenhagen, Denmark

Background
Porcine embryos are sensitive to temperature and cryoprotectants, especially after in-vitro production. Vitrification is a valuable method for cryopreservation of porcine PA embryos, but practical details about using this technique still remain as very few studies have focused on it.

Aim of study
To determine the optimal developmental stage of porcine parthenogenetically activated (PA) embryos for vitrification.

Material and methods

<table>
<thead>
<tr>
<th>Group</th>
<th>Total embryos (replicate)</th>
<th>Survival%±SEM at 4h (No.)</th>
<th>Survival%±SEM at 8h (No.)</th>
<th>Re-expanding%±SEM at 24h (No.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>D4 Morula</td>
<td>53 (4)</td>
<td>70.0±10.4 (38)a</td>
<td>66.7±12.8 (34)a</td>
<td>61.9±10.1 (32)a</td>
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<tr>
<td>D4 Blastocyst</td>
<td>54 (4)</td>
<td>68.8±13.8 (36)a</td>
<td>61.7±15.3 (32)a</td>
<td>59.6±14.9 (31)a</td>
</tr>
<tr>
<td>D5 Blastocyst</td>
<td>120 (8)</td>
<td>62.2±9.6 (73)a</td>
<td>41.7±10.6 (48)b</td>
<td>33.7±7.9 (40)b</td>
</tr>
<tr>
<td>D6 Blastocyst</td>
<td>53 (4)</td>
<td>21.0±3.9 (11)b</td>
<td>8.9±2.7 (5)c</td>
<td>2.0±1.6 (1)c</td>
</tr>
</tbody>
</table>

a, b, c Different letters in the same column indicate significant difference (P<0.05). Embryos were defined as survival when they shrank tightly with regular edge or formed blastocoele cavities. Embryos were defined as re-expanding when their cavities enlarged 1.2-1.5 times bigger than normal oocytes.

Results

- The PA embryos from Day 4 have highest recovery rates both the survival rate at 8h and the hatching rate at 24h after warming, no matter morula or blastocyst stage (P<0.05, Table1).
- There are variations in survival rate between different days. However, the survival rate was stable first from 8h after warming for all groups (Figure1).

Conclusion

The results indicate that:
- Porcine PA embryos can survive well after vitrification (app. 60%);
- The optimal time for vitrification of porcine PA embryos is Day 4 for both morulae and blastocysts;
- 8h can be used as a shortest reliable time point to evaluate recovery of porcine PA embryo after warming.