

## عنوان مقاله:

The Effect of Osmotic Stress on Developmental Competence of In Vitro Matured Bovine Oocytes

## محل انتشار:

بیستمین کنگره بین‌المللی بیولوژی تولید مثل و پانزدهمین کنگره بین‌المللی سلول های بنیادی (سال: 1398)

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## خلاصه مقاله:

**Background:** Increasing the permeability of the oocyte membrane can increase its ability to cryopreservation. Induction of sublethal controlled osmotic stress can improve the oocyte freezability through the increase the expression of genes associated with permeability of cell membranes such as aquaporins. Therefore, it was evaluated to establish whether the developmental capacity of the oocyte is affected by osmotic stress or not. **Materials and Methods:** Bovine immature aspirated oocytes from abattoir-derived ovaries were initially cultured in isotonic IVM medium (bicarbonate-TCM 199 supplemented with 10% FCS and 0.1IU/ml FSH) (osmolality was 280-285mOsm) for 1 hour adaptation. After that, the oocytes of treatment group were exposed to hyperosmotic medium (500-510mOsm IVM medium contained sorbitol) for 4 hours and then transferred to IVM medium. All of the maturation procedure was carried out at 38.5°C with a 5% CO<sub>2</sub>/air atmosphere for 22-24 hours. In vitro matured oocytes were exposed to motile epididymal sperm in TALP medium for 22-24 hours. After fertilization, denuded presumptive zygotes were cultured in SOFaaBSA medium in 5% CO<sub>2</sub>, 7% O<sub>2</sub>, and 88% N<sub>2</sub> for 9 days. **Results:** The results showed that exposure of bovine oocytes to high osmolality had not any effect on developmental competence of osmotic stress-treated oocytes. Hyperosmotic effects resulted in 0.04±0.02 oocyte degeneration, 67.9 ± 7.36 cleavage rate, and 23.61 ± 2.79 blastocyst rate versus 0.03 ± 0.02, 72.8 ± 4.28, and 21.56 ± 3.15 for control and treatment groups, respectively) (P> 0.05). **Conclusion:** The results of the present study demonstrated that oocyte is resistant to controlled osmotic stress even for up to 4h in maturation procedure. Understanding this resistance will allow the development of improved assisted reproduction methods such as cryopreservation for CPA addition and removal procedures during mammalian oocyte vitrification.

## کلمات کلیدی:

Osmotic Stress, Development, Bovine, Oocytes, Embryo

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