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Effect of Insulin-Like Growth Factor I (IGF-1) on oocyte competence and embryo development of buffalo (*Bubalus Bubalis*)

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Abstract : The aims of this work were studying the effects of insulin-like growth factor-I (IGF-1) on 1) In-vitro maturation (IVM) rate in buffalo oocytes, assessment of maturation were done by cumulus expansion for cytoplasmic maturation rate and presence of 1st polar body (MII) for nuclear maturation rate.2) in- vitro embryo developmental competence of buffalo (Bubalus Bubalis), assessment of developmental competence of buffalo embryos were done by detection of cleavage rate and transferable embryo rate (morula and blastocyst rate). Ovaries collected from EL-Warak slaughter house. Good and excellent oocytes were cultured in TCM-199 vs. TCM-199+ 100ng/ml IGF supplemented with 10% fetal calf serum (FCS) + 10 µg/ml follicle stimulating hormone (FSH) + 50 µg/ml gentamicin. COCs were matured for 22 h in incubator at 38.5°C in 5% CO2 and humidified atmosphere, Matured oocytes were fertilized with frozen thawed semen (washed by fertilization TALP) and incubated for 18 hours, then In vitro culture by SOF D=0 for 7 days. The experimental data were analyzed using paired t-test, P < 0.05 was considered to be statistically significant. The TCM-199 +IGF group showed no significant difference in cumulus expansion rate GIII, GII, GI or G0 $(42.77\pm3.41, 20.11\pm4.52, 12.78\pm2.36 \text{ and } 24.78\pm2.57\%)$ when compared with TCM-199 group (42.38 ± 1.73 , 20.07 ± 2.79 , 9.53 ± 1.96 and 28.02 $\pm 3.57\%$, respectively). The maturation rate of buffalo oocytes with polar body (MII) was significantly higher in the TCM-199+IGF group (ranged 81.21 ± 1.64 - $86.56\pm 2.06\%$) when compared with those matured in TCM-199 (ranged $70.18 \pm 0.92 - 73.48 \pm 0.46\%$). The cleavage rate was significantly higher (P<0.05) in TCM-199+IGF (90.61±2.38%) when compared with TCM-199 (76.50±2.41%). The transferable embryo rate (morula and blastocyst rates) showed significant increase (P<0.05) in IGF-I group (28.12±1.68 & 20.83±1.95%, respectively) when compared with TCM-199 group (20.20±2.85 & 12.85±2.51 % respectively). In conclusion addition of IGF-I in the TCM-199 in vitro maturation medium improve in vitro maturation rate and transferable embryo rate (morula & blastocyst) in buffalo. Keyword: Buffalo, in vitro embryo production, IGF-1.

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