Proceedings of the 8th International Symposium on Canine and Feline Reproduction

ISCFR

June 22-25, 2016
Paris, France

In a joint meeting with the XIX EVSSAR Congress

Reprinted in IVIS with the permission of the ISCFR Organizers
Can age and Anti-Mullerian Hormone levels predict the success of in vitro maturation of cat oocytes?
Féline Snoeck, Steven Sarrazin, Eline Wydooghe, Osvaldo Bogado Pascottini, Ann Van Soom
Dep. of Reproduction, Obstetrics and Herd Health, Ghent University, Merelbeke, Belgium
Feline.Snoeck@UGent.be

The domestic cat is a perfect research model for developing in vitro production (IVP) techniques for endangered felids. The last two decades, much progress has been made in the area of assisted reproduction in cats but nevertheless, in vitro maturation (IVM) success rates of cat oocytes are still highly variable between individual cats. Our own data show maturation rates for cat oocytes from 0.00 to 79.17% and this is also apparent in other laboratories with maturation rates between 41.7% and 71.2%. To enhance further research, we would like to establish parameters that can predict whether the oocytes of a cat will mature or not. We hypothesized that age and Anti-Mullerian Hormone (AMH) levels are related to the maturation capacity of the oocytes. To investigate this further, ovaries were collected from 33 cats of different ages after routine ovariectomy at local veterinary clinics. Furthermore, a blood sample was taken from the cephalic vein. The sample was centrifuged and serum was stored at -20°C until analysis for AMH (Electrochemiluminescence immunoassay, Elecsys®, Cobas, aml, Antwerp). The ovaries were stored at 4°C in sterile 0.9% sodium chloride solution supplemented with 50 µg/mL gentamicin. Cumulus-oocyte-complexes (COC) were collected by mincing the ovaries in Hepes-TALP medium at 38°C. The COCs were graded and only grade I and II oocytes were collected (n = 1231) and matured in four-well dishes containing 500 µl IVM medium (SOF IVM supplemented with Chorulon, Folligon, Heparin, Epidermal growth factor, Insulin, Transferrin and Selenium). All COCs were matured for 24 h in a humidified atmosphere of 5% CO₂ in air at 38.5°C. After maturation, COCs were vortexed, fixed in 4% paraformaldehyde and stained with Hoechst to check the maturation status. All cats were divided in 3 age groups: 1) from 0 to 3 months (n = 7); 2) from 3 to 12 months (n = 11) and 3) older than 12 months (n = 15). The AMH levels varied between 0.49 µg/L and 23.00 µg/L with an average level of 8.94 µg/L (95% CI: 6.56-11.31). Increasing age was significantly associated with decreasing AMH levels (One-way ANOVA, F-value 36.42; p < 0.001) and mean AMH levels differed significantly between all age categories (p < 0.05): group 1: mean AMH 18.71 µg/L (95% CI: 14.25-23.18); group 2: mean AMH 9.27 µg/L (95% CI: 6.26-12.29) and group 3: mean AMH 4.13 µg/L (95% CI: 2.83-5.43). Moreover, the probability of maturation was significantly lower in group 1 compared to group 2 (odds ratio = 7.29; 95% CI 2.71-19.65) and 3 (odds ratio = 10.90; 95% CI 4.29-27.72) following a generalized linear mixed model. Between age category 2 and 3, no significant difference in maturation probability was found (p = 0.31). Finally, the probability of oocyte maturation decreased significantly with increasing AMH levels (OR per µg/L increase of AMH = 0.89; 95% CI 0.84-0.94). We can conclude that if a higher probability of maturation is required, it is preferable to use cats older than 3 months of age in order to improve cat IVP and if possible cats with low AMH-levels.