called fowl glioma and the remained 5 birds were suspected to be affected with this disease. In addition, lmphoproliferative foci were found in the various organs of all seven affected bantams. The normal structure was occasionally destructed by the lymphocytic infiltration or aggregation, especially in heart and bone marrow. These results suggested that so-called fowl glioma is prevalent in the bantam flock of this zoological garden.

In vitro growth and maturation of bovine oocytes from early antral follicles

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Recent progress in the culture system of growing bovine oocytes made it possible to use the oocytes in early antral follicles for *in vitro* production of bovine embryos. This technique is also useful as a model to study the physiology of follicular development and ovulation. The present study was conducted to examine the growth rate and maturational competence of bovine growing oocytes (<100 μm in diameter) in early antral follicles.

First, the relationship between oocyte and follicle sizes were examined to estimate the oocyte diameter from the folliclular diameter. Most (93%) of the follicles with 0.5 to 1 mm in diameter had formed antrum and contained the oocytes with 92.2 μm in mean diameter. In this study, follicles with a diameter of 0.5 to 1 mm were defined as early antral follicles. Then, the maturation and developmental competence of oocytes from these early antral follicles were examined. Although 12% of oocytes had resumed meiosis after 24 h of *in vitro* maturation culture in TCM 199 with 10% fetal calf serum (FCS) and hormones (FSH+E_2), none of them reached the metaphase II stage. Cumulus-oocyte-granulosa complexes (COGCs) derived from early antral follicles were embedded in collagen gels and cultured for 4, 8, 10 or 14 days in TCM 199 with 10% FCS and 4 mM hypoxanthine to examine the meiotic competence of *in vitro* grown oocytes. All of COGCs formed antrum-like structures after 4 days of culture. After 4 days of the growth culture, the mean diameter of the oocytes recovered from COGCs was 102.7 μm, and the majority (72%) remained at germinal vesicle stage after the maturation culture. The mean diameter of the oocytes from COGCs was 112.7 μm after 8 days of the growth culture, and about 40% reached the metaphase II stage after maturation. Proportion of intact COGCs was reduced after 10 and 14 days of the growth culture due to the granulosa cell outgrowth. There was no oocyte that reached the metaphase II stage after the maturation culture.

The present study confirmed that oocytes from early antral follicles had no ability to mature without the growth culture. They need to be cultured for 8 days in the growth culture before maturation to acquire maturational competence to metaphase II stage.