



A036 Folliculogenesis, Oogenesis and Ovulation

Characterization of ovarian follicle reserve depletion in Ames dwarf mice

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Ames dwarf mice are deficient in growth hormone (GH) secretion and therefore have reduced levels of insulin-like growth factor type I (IGF-I). Their life expectancy is around 30-50% longer than normal mice (Masoro; Mech Ageing Dev; 2005; 126: 913-22). Studies have shown that the IGF-I signaling pathway is involved in the regulation of follicular growth and development (Ahmed & Farquharson; J Endocrinol, 2010; 206: 249-59). Therefore, the aim of this study was to evaluate the number of follicles in the primordial, primary, secondary and tertiary stages, as well as follicular and oocyte diameters in Ames Dwarf and Normal mice. Ovaries of normal (n=3) and Ames Dwarf (n=4) mice at 12 months of age were used. Ovarian samples were processed, sequentially cut and stained with hematoxylin-eosin. Ovarian sections were assessed in an optical microscope using 10x and 40x objectives for the classification, quantification and measurement of ovarian structures. One of each six histological sections per slide was evaluated. Statistical analyzes was performed using t-tests with the GraphPad Prism 5 software (La Jolla, CA, USA). Differences were considered significant when $P < 0.05$. Ames dwarf mice presented ($P = 0.001$) more primordial follicles (1548 ± 139) compared to normal mice (378 ± 125). These data indicate that primordial follicles are not progressing to the primary stage, possibly due to reduced serum levels of IGF-I and insulin, indicating that these mice can be a good model to study the relationship between metabolic status and ovarian aging. The number of secondary and tertiary follicles was not different between Ames dwarf and normal mice ($P > 0.05$). The total number of follicles tended ($P = 0.07$) to be higher in Ames dwarf ($2,673 \pm 209$) than in normal mice ($1,668 \pm 445$). Regarding follicle and oocyte diameters, we only observed a larger diameter ($P = 0.02$) for oocytes included in primordial follicles from normal ($6.8 \pm 0.4 \mu\text{m}$) compared to Ames Dwarf mice ($5.5 \pm 0.3 \mu\text{m}$). In conclusion, Ames Dwarf mice have more primordial follicles compared to normal mice, suggesting that GH, IGF-I and insulin deficiency leads to the accumulation of follicles in the primordial stage and increase ovarian longevity.