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Relationship between Initial Size of Pre-Antral Follicles and Intra-Follicular Oocytes and Their *In Vitro* Growth in Mice

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Purpose : This study was conducted to obtain the relationship between initial size of pre-antral follicles (PAF) and intra-follicular oocytes (IFO) and their *in vitro* growth (IVG) in medium without gonadotropins (Gns) using PAF isolated from mouse ovaries mechanically.

Methods : The PAF of initial size 71~130 μm were isolated from ovaries of ICR mice (3~6 weeks old) by mechanically not using enzymes and cultured individually in 20 μl Dulbecco's Modified Eagle Medium containing 10% FBS without Gns. The PAF was classed as 71~90 μm (85.1 \pm 4.4 μm , group I), 91~110 μm (100.7 \pm 5.2 μm , group II) or 111~130 μm (120.3 \pm 4.6 μm , group III) by size and cultured for 8 days. Growth rate (GR) of PAF and IFO were observed. Results among groups were analyzed by Student's *t*-test, and considered statistically significant when $P < 0.05$.

Results : GR of PAF in group III (231.3 \pm 91.3 μm , 92.3 \pm 75.5%) were higher than that in group I (93.4 \pm 9.9 μm , 10.1 \pm 13.2%, $P=0.0007$) and II (154.7 \pm 54.8 μm , 53.5 \pm 54.8%, $P=0.0129$), and ones in group II were higher than that in group I ($P=0.0186$) on day 8. GR of IFO in group I (64.50 \pm 7.1 μm , 31.1 \pm 14.4%) was higher (NS) than that in group II (75.1 \pm 9.0 μm , 27.9 \pm 12.3%) and III (80.4 \pm 9.4 μm , 22.4 \pm 9.7%) and higher (NS) in group II than in group III on day 8.

Conclusions : Initially larger PAF grow faster than the smaller ones. In contrast, the GR of the smaller IFO was higher than the rate of the bigger ones. Medium without Gns can be used for IVG of mouse PAF isolated mechanically.

Key words: *Pre-antral follicles, Intra-follicular oocytes, Initial size, In vitro growth, Medium without gonadotropins*