Roles of osteocyte apoptosis in steroid-induced avascular necrosis of the femoral head

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ABSTRACT. An animal model of steroid-induced avascular necrosis of the femoral head (SANFH) was established to investigate the roles of osteocyte apoptosis in this process. Forty-five-month-old male and female Japanese white rabbits were randomly divided into groups A (hormone + endotoxin), B (hormone alone), C (endotoxin alone), and D (blank control). Animals were sacrificed two and four weeks following the final treatment (N = 5 for each group at each time point). Bilateral femoral heads were fixed and decalcified, and empty lacunae were counted by hematoxylin staining. At weeks 2 and 4, the empty lacunae percentage was significantly higher in group A than that in groups B, C, or D (P < 0.01), while no significant difference was observed between these latter three. At week 2, all osteocyte apoptosis indexes were within normal ranges in all the groups, which therefore did not significantly differ in this respect (P > 0.05). However, at week 4, the apoptotic index was significantly higher in group A than that in
groups B, C, or D (P < 0.01), comparisons between which revealed no such differences. Moreover, a positive correlation was observed between the percentage of empty lacunae and the apoptotic index at week 4 in group A ($r = 0.893$). We conclude that osteocyte apoptosis plays an important role in SANFH.

**Key words:** Hormone; Femoral head; Necrosis; Apoptosis