Drynaria total flavonoids decrease cathepsin K expression in ovariectomized rats

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ABSTRACT. This study investigated the effects of Drynaria total flavonoids on cathepsin K serum concentrations and gene expression, biomechanics and bone mineral density (BMD) of the tibial shaft in ovariectomized rat models of osteoporosis, and mechanism in the prevention and cure of osteoporosis. Seventy-two female Sprague-Dawley rats were divided into six groups. The rats in each group were subjected to gastric lavage after the model was established. The tibial shaft of the right hindlimb was obtained to measure the BMD. Serum cathepsin K concentrations were determined. The cathepsin K mRNA expression was also determined using fluorescent quantitative polymerase chain reaction. The three-point bending method was performed to measure the maximum bending load of the tibial shaft. The total flavonoid and normal groups had significant differences in serum cathepsin K concentrations compared with that in the estrogen group (P < 0.05). The total flavonoid and sham-operated groups also showed significant differences in cathepsin K mRNA expression compared with that in the normal group (P < 0.01). The maximum
bending load of the rats in the total flavonoid group was significantly different from that in the estrogen group (P < 0.05) and the sham-operated and normal groups (P < 0.01). The high-dose total flavonoid group elicited a better effect on BMD than that by the medium- and low-dose groups (P < 0.05). Thus, *Drynaria* total flavonoids inhibited the serum cathepsin K concentration and increased the maximum bending load of the tibial shaft in ovariectomized rats.

**Key words:** *Drynaria* total flavonoids; Ovariectomized rats; Cathepsin K; Biomechanics; Bone mineral density