

Effects of Blood Flow Restriction on Gait, Muscle weight, Pain, Hormone in Rats with Knee Osteoarthritis.

- **Author(s):** Seung-Kyu Kim, Gak Hwang-Bo
- **Abstract:** This study is to investigate the effect of treadmill exercise with blood flow restriction (BFR) and low-intensity treadmill exercise on rats with knee osteoarthritis. Thirty SD male rats that induced knee osteoarthritis were used as experimental subjects. Low-intensity treadmill exercise with BFR group (Experimental group I; n=10) and low-intensity treadmill exercise group (Experimental group II; n=10), and the non-exercise group (Control Group; n=10) were randomly assigned. Each group exercised for 30 minutes 5 times a week for a total of 3 weeks. For the kinematic analysis of gait, the ankle angle, knee angle, and step time at the initial step were measured using the dartfish program. To evaluate the degree of muscle atrophy, the weight of the soleus muscle was measured. To measure c-fos expression (pain), western blot test was measured, and catecholamine test was measured for epinephrine and norepinephrine hormones. As a result, EG I showed significantly increase in ankle angle and knee angle during initial stepping phase, stepping time, muscle weight, and significantly decrease in c-fos expression, and epinephrine, norepinephrine hormones ($p < .01$). In EG II, there was significant decrease in ankle angle and knee angle, step time, muscle weight, and significant increase in epinephrine, norepinephrine hormones ($p < .01$). And there was no significant in c-fos expression ($p > .05$). Since knee osteoarthritis is a chronic disease accompanied by severe pain, patients experience pain in exercise therapy, walking, and daily activities. However, as shown in the results of this study, low-intensity treadmill training combined with BFR showed significant improvements in gait, muscle weight, pain, and hormones in subjects with knee osteoarthritis. It can be presented to patients as an effective and pain-free exercise method.
- **Keywords:** treadmill, osteoarthritis, BFR, dartfish, catecholamine, epinephrine, hormones, patients.