

## عنوان مقاله:

Studying Changes of the Effective Radius in Blood Vessels after Exposure of Lower Extremities to Periodical Mechanical Vibrations

## محل انتشار:

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## خلاصه مقاله:

Background: Previous studies demonstrated a health improving effect in patients underwent an automatic vibratory massage taking ۱۰ minutes. One of reasons that may explain a healing effect of the automatic massage is a stimulated increase in both blood circulation through vascular system and effective size of blood vessels. Objective: This paper aims to quantify a contribution of the automatic mechanical massage of lower extremities into the observed reduction in arterial blood pressure and explain this effect. Material and Methods: In our experimental study, the lower extremities of male and female patients were exposed to low frequency (۱۲ Hz) mechanical vibrations for ۱۰ minutes and the change in systolic and diastolic arterial blood pressures before and after this procedure was measured. Results: The experiments showed there is a reduction in systolic and diastolic arterial blood pressures after vibrational massage. There were corresponding  $3.5 \pm 1.8$  mmHg and  $3.1 \pm 1.6$  mm Hg arterial blood pressure reductions among men and  $5.5 \pm 3.2$  mm Hg and  $2.2 \pm 1.2$  mm Hg reductions among women. Conclusion: We explained this effect by increasing effective radius of blood vessels. Based on the Hagen-Poiseuille equation, we made estimates for the relative change in the effective radius of blood vessels. They gave the ۰.۷% and ۱.۳% increases in the effective radius of blood vessels in lower extremities in men during systole and diastole, respectively, and the corresponding ۱.۱% and ۰.۶% increases in the effective radius of blood vessels of lower extremities in women during the same periods.

**کلمات کلیدی:**

Blood pressure, Low Frequency Mechanical Vibrations, Whole Body Automatic Massage, Hypertension, Blood Circulation Improvement, Cardiovascular system

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