学位論文内容の要約

学位論文題目

Changes of microvascular reactions induced by intermittent mechanical pressure

（間歇的圧迫刺激による微小血管の反応）

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Previously, the studies of intermittent mechanical pressure were designed with long term loading duration which causes ischemia and there is no report about microvascular reactions induced by intermittent mechanical pressure without ischemia until now. Investigation of microvascular reactions induced by intermittent mechanical pressure without ischemia is expected to lead better understanding in effect of mechanical pressure against tissues. The aim of this study is to clarify changes of microvascular reactions induced by intermittent mechanical pressure without ischemia.

Six-week-old male hamsters with a dorsal skinfold chamber attached to an intermittent loading device were used. Pressure was adjusted to 100 g/cm^2. Loading/unloading duration was regulated precisely by an electronic circuit. Five hamsters without mechanical loading were used as controls. In three experimental groups (five hamsters in each group), application of intermittent pressure that involved repetition of loading and unloading was performed. The durations of loading/unloading for the three groups were 1 sec/9 sec (Group T10), 1 sec/19 sec (Group T20), and 1 sec/29 sec (Group T30). The observation period was five days. Vessels were examined using a fluorescence microscope and a stereomicroscope.

Diameters of capillaries in groups T10 and T20 increased significantly ($p<0.01$) to the diameters of post-capillary venules, but there was no significant difference between these two groups on the last day. Diameters of capillaries in group T30 showed no significant difference compared to the control group. Only group T10 showed bleeding, obvious destruction of vessels, and significant increase in the disappearance rate of vessels. T10 induced dilation of capillaries but also caused damages. It could be said that T10 was not sufficient condition for intermittent mechanical pressure without ischemia. Microvasculature shows vasodilation and the diameters of capillaries exceed 8μm with intermittent mechanical pressure of T20. The size of microvasculature remains almost same as its original with intermittent mechanical pressure of T30.