

MEASUREMENT OF FLOW CHARACTERISTICS DURING INDIVIDUAL CONTRACTIONS IN BOVINE MESENTERIC LYMPHATIC VESSELS***M.K. Ferguson, U. Williams**

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ABSTRACT

We developed a novel technique for measuring flow characteristics during individual contractions in lymph vessels. Bovine mesenteric lymph vessel segments (n=15) were mounted in organ baths and allowed to equilibrate for 1 hr. Transmural pressure was subsequently increased by 2 cm H₂O increments at 15 min intervals and vessel outputs were collected during the final 10 min of each period and measured. Flow also was continuously recorded with an in-line Doppler transducer connected to a flow analyzer, and flow characteristics were analyzed.

The two methods of flow measurement correlated well ($r^2 = 0.92$). Mean flow increased with increasing transmural pressure and reached a maximum of 0.5 ± 0.1 ml/min at a transmural pressure of 8 cm H₂O. The rate of spontaneous contractions, the peak flow during a contraction-induced wave, and the total volume of flow during a wave also increased with increasing transmural pressure and reached maximums of 12.4 ± 1.0 min⁻¹, 8.2 ± 1.6 ml/min, and 0.21 ± 0.06 ml, respectively. Wave duration changed little in response to changes in transmural pressure.

Continuous in-line flow measurement is an accurate technique for assessing flow characteristics during individual contractions in lymph vessels in vitro. Transmural pressure regulates flow by influencing spontaneous contraction frequency and total and peak flows during contraction-induced waves.
