

Local and systemic vascular hemodynamic response to passive static stretching in young healthy humans.

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The aim of the present study was to determine the acute effects of passive static stretching (PSS) on femoral blood flow (FBF) in a stretched and non-stretched limb. Our hypothesis was that PSS would increase FBF in the stretched limb mainly through local vasodilator mechanisms. PSS effects may be expected also in the non-stretched limb possibly through an imbalance between the systemic hemodynamic control and the local vasodilator response.

To this purpose, eight young healthy individuals (age: 22 ± 3 yrs) underwent PSS (5 cycles of 45 s stretch/15 s rest) of the knee extensors of the dominant limb. Femoral artery blood velocity and diameter were taken from both limbs by ultrasound. FBF was then calculated.

PSS increased FBF by $\sim 78\%$ in the stretched limb (from 495 ± 110 to 882 ± 121 ml/min; $P<0.05$). FBF returned to baseline within the end of the 45 s stretch. Conversely, FBF decreased transiently by $\sim 71\%$ (from 334 ± 155 to 138 ± 17 ml/min; $P<0.05$) in the non-stretched limb during PSS maneuver.

In conclusion, PSS increased FBF in the stretched limb, and induced a FBF decrease in the contralateral limb. These findings may suggest the predominance of a local vasodilator mechanism in the stretched limb during PSS maneuver, probably induced by nitric oxide release. On the contrary, a possible systemic vasoconstriction, likely mediated by an elevation of sympathetic nerve activity, may prevail in the contralateral limb.