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JOURNAL ARTICLE

Localization and effects of calcitonin gene-related peptide in the testicular vasculature of the rat

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Using laser Doppler flowmetry, the effects of unilateral intratesticular injection of calcitonin gene-related peptide (CGRP) and CGRP8-37, a CGRP-receptor antagonist, on right- and left-testicular blood flow and mean arterial pressure were studied on anesthetized adult rats. Calcitonin gene-related peptide in doses of 5 and 50 ng increased blood flow $37 \pm 11\%$ (mean \pm SEM, $P < 0.05$) and $30 \pm 5\%$ at 5 mm, but not 15 mm, away from the injection site, respectively. They did not influence mean arterial pressure nor blood flow in the contralateral testis. Five-hundred nanogram doses increased testicular blood flow in the injected testis at a point 15 mm away from the injection site ($22 \pm 3\%$, $P < 0.05$) and caused a slight decrease in mean arterial pressure ($-12 \pm 3\%$, $P < 0.05$). The highest dose, 5 micrograms, caused a large ($-39 \pm 3\%$, $P < 0.05$) fall in mean arterial pressure within 1 minute after injection, and testicular blood flow was reduced in both the injected ($-9 \pm 2\%$, $P < 0.05$, 15 mm away from injection site) and contralateral testis ($-20 \pm 5\%$, $P < 0.05$). Pretreatment with 500 ng of the receptor antagonist, CGRP8-37, did not significantly attenuate the blood flow increasing affect of 50 ng CGRP, nor did 50 micrograms CGRP 8-37 (given alone) influence basal testicular blood flow in the injected testis. Using immunohistochemistry, CGRP-containing nerves were observed in the superior and inferior spermatic nerves, in the testicular artery, and in the veins leaving the testis but not in intratesticular blood vessels. Conclusions: 1) CGRP is a potent vasodilator in the testicular vasculature and it may be involved in the local regulation of testicular blood flow: 2) the testis has limited capacity to autoregulate and is consequently unable to maintain a constant testicular blood flow during large and rapid reductions in blood pressure, and 3) the local and systemic effects of vasodilators act in opposite directions in the testis.

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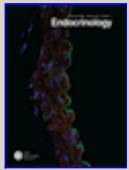
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