

Baroreflexes play a major role in regulating the long-term level of sympathetic nerve activity

S.J. Guild, C.J. Barrett, R. Ramchandra and S.C. Malpas, Circulatory Control Laboratory, Department of Physiology, University of Auckland, Private Bag 921019, Auckland, New Zealand.

It is accepted dogma that arterial baroreflexes play no role in the long-term regulation of arterial pressure because they exhibit resetting in response to sustained increases in arterial pressure. However, a recent study from our laboratory (Barrett *et al.*, 2003) challenges this view. We observed that chronic infusion of angiotensin II (7 days, 50ng/kg/min i.v.) caused an increase in mean arterial pressure (MAP) and a sustained decrease in renal sympathetic nerve activity (RSNA). Also, although the MAP-heart rate baroreflex curve showed resetting, the MAP-RSNA baroreflex curve did not. These results suggest that baroreflex control of RSNA is likely to play a significant role in the long-term control of arterial pressure. Full interpretation of these results is however made difficult by the direct and central nervous system effects of angiotensin II on RSNA. It is important therefore to investigate this result further using an alternative method of increasing arterial pressure. In this current study chronic infusion of phenylephrine was chosen.

In New Zealand white rabbits, living in their home cages, arterial pressure and RSNA were recorded continuously using telemetry devices before, during and after a 7-day infusion of phenylephrine (30mg/kg/hr i.v.) using an osmotic mini pump. The modest but sustained increase in MAP during phenylephrine infusion was accompanied by significant bradycardia and decreased RSNA (~30%) over the 7-day infusion period. Baroreflex responses were derived using rapid infusions of sodium nitroprusside and phenylephrine before, at day 2, and 7 of phenylephrine infusion and again after removal of the osmotic pump. The MAP-RSNA curves during phenylephrine infusion not only showed no evidence of the rightward shift suggesting resetting, but also showed a decrease in range and the resting points lie near the lower plateau of these curves suggesting that the decreased RSNA observed during phenylephrine infusion is due to the baroreflex. These results suggest that the similar changes to the baroreflex curves observed during angiotensin II infusion are independent of the central or direct effects of angiotensin II and are mediated by the inducement of hypertension. Overall these results support the notion that the baroreflexes **do** play an important role in regulating the long-term level of RSNA.

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