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## Right ventricular pacing impairs endothelial function in man.

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### Abstract

**Aims** Clinical trial data show that right ventricular pacing worsens cardiovascular outcomes. The underlying pathophysiology of this is undetermined. We studied the effects of right ventricular pacing on cardiac measures of vascular health (endothelial function), ventricular wall stress (B-type natriuretic peptide), and cardiac reserve (cardiac output response to exercise) in subjects with pacemakers. **Methods and results** Twenty-two subjects [mean age  $68.4 \pm 8.8$  (SD) years] with dual-chamber pacemakers implanted for sino-atrial disease were studied in a randomized crossover study comparing minimal right ventricular pacing [RVP-min; pacing with long atrioventricular delay (AVD)] to maximal right ventricular pacing (RVP-max; pacing with short AVD). Endothelial function was measured with reactive hyperaemia peripheral arterial tonometry. Cardiac output at rest and during exercise was determined using an inert gas rebreathing method. Right ventricular pacing was significantly higher in RVP-max when compared with RVP-min ( $90 \pm 16$  vs.  $15 \pm 20\%$ ,  $P < 0.001$ ). Reactive hyperaemia peripheral arterial tonometry index was significantly lower after RVP-max vs. RVP-min ( $1.73 \pm 0.33$  vs.  $1.96 \pm 0.37$ ,  $P < 0.05$ ). B-type natriuretic peptide was not significantly different between pacing modes ( $113 \pm 80$  vs.  $104 \pm 108$  pg/mL,  $P = \text{NS}$ ). Cardiac output at peak exercise was significantly lower during RVP-max ( $7.65 \pm 3.15$  vs.  $7.05 \pm 2.61$  L/min,  $P < 0.05$ ). **Conclusion** Right ventricular pacing is associated with worsened endothelial function and cardiac reserve.

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