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Repeated injection of atrial natriuretic peptide (α-hANP) in normal man: cardiovascular and renal actions


In 6 healthy volunteers, 200 μg of α-hANP were given twice as an intravenous bolus injection within 30 min. M-mode-echocardiography was performed and serum levels of ANP and cGMP as well as cGMP-, sodium- and potassium excretion were determined.

After each injection, a clear-cut increase of stroke volume by 15%, ejection fraction by 16% and cardiac index by 16% was observed (p < 0.01). Hemodynamic changes were most pronounced from 10 to 15 min after each administration and reached baseline values another 15 min later. Serum ANP rose 20fold; cGMP increased from 3.2 ± 1.1 to 25.0 ± 6.7 nmol/l within 10 min after the first injection and from 20.0 ± 6.0 before the second administration to 32.7 ± 11.1 nmol/l another 10 min later. Urinary cGMP excretion rose 9fold, urine volume 12fold, sodium excretion 6fold and potassium excretion doubled. These renal actions were still present for at least 90 min later. No severe side effects were observed.

Conclusions: 1. Renal effects caused by α-hANP are more persistent than its cardiovascular actions. 2. Using a dosage interval of 30 min reproducible improvement of myocardial performance can be obtained by a second bolus injection. 3. The role of cGMP as a marker for ANP is confirmed.