Atropine often results in complete atrioventricular block or sinus arrest after cardiac transplantation: an unpredictable and dose-independent phenomenon

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BACKGROUND: A paradoxic response to atropine with development of atrioventricular (AV) block has been described in patients after heart transplantation (HTx). We investigated further the incidence and dose-response relationship of this paradoxic atropine response and explored predictive factors.

METHODS: We investigated 25 clinically stable patients (age 55 +/- 2 years) 18 to 126 months after HTx. After endomyocardial biopsy, a temporary pacemaker was introduced and patients were monitored. Atropine was given in ascending doses (0.004 mg/kg body weight initially, total cumulative dose 0.035 mg/kg body weight). Physiologic tests were performed to evaluate the presence of reinnervation.

RESULTS: In 20% of the patients (5/25), a paradoxic response to atropine was observed. Four patients exhibited third degree AV block, one of whom also demonstrated sinus arrest. A fifth patient showed sinus arrest only. In all patients but one, there was no ventricular escape rhythm before ventricular pacing was commenced (10 sec after block). The observed adverse effect was not correlated with the applied atropine dosage, and predisposing factors could not be identified, apart from a slightly lower resting heart rate (80 +/- 5 vs. 90 +/- 2 beats/min, P = 0.07).

CONCLUSION: A significant proportion of patients respond paradoxically to atropine after HTx, leading to asystole as the result of sinus arrest or AV block. Although a plausible explanation for this effect remains speculative, our data indicate that the use of atropine or other anticholinergic drugs in patients after HTx is contraindicated.