

## **Effects of ventricular rate and regularity on the velocity and magnitude of left atrial appendage flow in atrial fibrillation**

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### **Abstract:**

To prospectively determine whether ventricular rate and regularity are significant determinants of the velocity and magnitude of left atrial appendage (LAA) flow. 12 patients with atrial fibrillation (AF), high degree atrioventricular block, and indwelling permanent pacemakers were studied. Cardiology department of a tertiary referral centre. Pacing was triggered by an external programmable transcutaneous device. Patients were paced at 60, 120, and 150 beats/min in both regular and irregular rhythm. LAA flow velocity and magnitude were assessed with transoesophageal Doppler echocardiography. Main outcome measures: Peak and mean LAA inflow and outflow velocity, and time-velocity interval (TVI) of LAA flow. Increasing ventricular rate was associated with significantly lower peak inflow ( $p < 0.01$ ), peak outflow ( $p < 0.05$ ), mean inflow ( $p < 0.01$ ), and mean outflow ( $p < 0.05$ ) velocities and with a lower TVI of LAA filling and emptying velocities ( $p < 0.01$ ). This effect was noted at rates of 60 beats/min compared with both 120 and 150 beats/min. At a pacing rate of 120 beats/min there was a significantly higher total TVI when pacing at a regular than at an irregular rhythm (40.16 (14.6) cm v 30.74 (10.9) cm,  $p < 0.05$ ). In this study, LAA filling velocities in patients in AF were significantly influenced by paced ventricular rate and to a much lesser extent ventricular rhythm. These results suggest that rapid ventricular rates may predispose to stasis in the LAA in AF.