Cardiac aliasing in atrial rate variation response to fixed-rateventricular pacing

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Abstract

The atrial rate variation (ARV) frequency components for an AV (arteriovenous)-block patient with fixed-rate ventricular pacing vary irregularly with the pacing rate. In this study, we attempt to learn about the relationship between the oscillation frequency of ARV and the blood pressure (BP) pattern. The beat-to-beat ARVs extracted from esophageal ECG and non-invasive BP waveforms of seven AV-block patients were recorded. Each patient was paced at three ventricular rates: 60, 90 and 120 beats/min. The results revealed that the oscillation frequency of ARV does not correlate with the variation frequency of systolic or diastolic BP or with the respiration frequency. Instead, it may be an aliasing phenomenon of the BP pulse frequency which is exactly equal to the ventricular rate when the mean atrial rate is considered as the ARV signal sampling rate. This study suggests that the BP pulse dominates the ARV in AV-asynchronous situations