Are plasma natriuretic peptide levels influenced by automatic pacemaker algorithms for ventricular pacing minimization?

Automatic atrioventricular search hysteresis (AVSH) is designed to reduce the cumulative percentage of potentially deleterious right ventricular apical pacing (VP%) in dual-chamber pacemakers. We investigated whether minimizing VP% by AVSH can, in turn, reduce ventricular wall stretching/stress, as assessed by plasma concentrations of the amino-terminal fragment of the pro-B-type natriuretic peptide (NT-proBNP). After dual-chamber pacemaker implantation in 81 patients (age: 69 ± 11 years; males: 55.6%), the fixed atrioventricular delay of 225 ms was programmed and AVSH was turned off for 1 month. The patients were thereafter randomly assigned to standard AVSH for 1 month, followed by an enhanced AVSH for another month, or vice versa. At the 1-, 2-, and 3-month follow-ups, VP% values were retrieved from the pacemaker memory, and venous blood samples were taken for NT-proBNP measurements. Both standard and enhanced AVSH reduced the median VP% value from 38.5% (for the fixed atrioventricular delay) to 2.1% (P < 0.001). However, plasma NT-proBNP concentrations for the fixed atrioventricular delay (median, 253 pg/mL), standard AVSH (225 pg/mL), and enhanced AVSH (276 pg/mL) did not differ significantly on the intrapatient basis (paired Wilcoxon
tests) between any pair of these modalities. Minimizing ventricular pacing by AVSH during 1 month had no influence on plasma NT-proBNP levels (i.e., ventricular wall stretching/stress) compared with a constant, moderately prolonged atrioventricular delay.