

Influence of Atenolol on Heart Rate Variability Early after Acute Coronary Heart Disease

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Aim. Randomized study of the effects of 50 mg atenolol on the heart rate, heart rate variability, and its circadian rhythm in patients with acute coronary heart disease three weeks after hospital admission.

Methods. We studied 82 patients with acute coronary heart disease, 64 men and 23 women (median 55 years; range 26-69), admitted to the Coronary Care Unit. Heart rate and heart rate variability were assessed in various portions of a complete 24-hour electrocardiographic recording obtained three weeks after hospital admission. The onset of the analyzed portions was 20 minutes apart (72 values positioned from 00:00 to 23:40) and the duration of the analyzed portions was also 20 minutes. Multistage exercise testing on a bicycle ergometer was performed on the 18th day after the supposed onset of the acute coronary heart disease. Heart rate and heart rate variability from 5-minute ECG strip recordings before and after the exercise test were measured.

Results. In comparison to 44 patients who did not receive atenolol, 38 patients on atenolol had significantly higher 24-hour mean RR interval (lower heart rate) and 24-hour standard deviation in RR intervals (heart rate variability): 999.1 ± 135.4 vs. 836.5 ± 151.6 ms ($p < 0.001$), and 71.4 ± 37.5 vs. 65.9 ± 37.9 ms ($p < 0.001$), respectively. Mean RR interval and standard deviation of RR intervals were significantly increased during daytime and nighttime in patients on atenolol in comparison to the control subjects. In all the patients, heart rate but not heart rate variability followed the expected circadian rhythm. Before and immediately after the exercise, the mean RR interval and standard deviation of RR intervals were significantly higher on atenolol than in controls: 894.5 ± 184.6 vs. 739.0 ± 131.5 ms ($p = 0.001$), and 632.1 ± 120.3 vs. 564.8 ± 93.0 ms ($p = 0.031$); 69.4 ± 38.1 vs. 61.1 ± 36.3 ms ($p = 0.010$), and 50.3 ± 29.2 vs. 44.1 ± 25.3 ms ($p = 0.038$).

Conclusion. Atenolol enhances parasympathetic cardiac activity early after an acute coronary event. Increased vagal tone may contribute to the beneficial antiarrhythmic effect of beta blockers.

Key words: *atenolol; coronary disease; heart rate*

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