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Clinical Investigations

Twenty-Four Hour Continuous ECG Recordings in Long-Distance Runners

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Twenty-four hour ambulatory ECG recordings were performed on 20 male long-distance runners, aged 19 to 28 years, during normal activities other than running. Average, maximum, and minimum waking heart rates, respectively, ranged from 58 to 108 (mean $\bar{x} \pm SD$, 73 $\bar{x} \pm 15$), 90 to 164 (120 $\bar{x} \pm 19$), and 34 to 53 (43 $\bar{x} \pm 5$) beats/min. Longest waking sinus pauses ranged from 1.35 to 2.55 (1.7 $\bar{x} \pm 0.3$) seconds. Average, maximum, and minimum sleeping heart rates, respectively, ranged from 38 to 58 (47 $\bar{x} \pm 6$), 69 to 114 (83 $\bar{x} \pm 14$), and 31 to 43 (36 $\bar{x} \pm 3$) beats/min. Longest sleeping sinus pauses ranged from 1.60 to 2.81 (2.0 $\bar{x} \pm 0.3$) seconds. All 20 runners had atrial premature beats, but only one (5 percent) had more than 100/24 hours. Fourteen runners (70 percent) had ventricular premature beats, but only two (10 percent) had more than 50/24 hours, and none had ventricular couplets or ventricular tachycardia. Eight runners (40 percent) had one or more episodes of type 1 second-degree atrioventricular (A-V) block. Compared with untrained males of similar age, the runners had slower heart rates (by approximately

10 beats/min), longer sinus pauses, and a higher prevalence of A-V block. Runners and untrained males did not differ with respect to prevalence of ventricular premature beats, R on T phenomenon, ventricular couplets, or ventricular tachycardia.



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