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Problem of heart rate disturbances in endurance athletes - are heart rate monitors valuable tools for diagnosing arrhythmias?

Robert Gajda[1], **E.K. Biernacka**[2] and **W. Drygas**[2]
[1]Gajda-Med Medical Center, Poland
[2]Institute of Cardiology, Poland

Millions of physically active individuals worldwide use heart rate monitors (HRMs) to control their exercise intensity. In many cases, the HRM indicates an unusually high heart rate (HR) or even arrhythmias during training. Unfortunately, studies assessing the reliability of these devices to help control HR disturbances during exercise did not exist. We examined 142 regularly training endurance runners and cyclists, aged 18-51, with unexplained HR abnormalities indicated by various HRMs to assess the utility of HRMs in diagnosing exertion-induced arrhythmias. Each athlete simultaneously wore a Holter electrocardiogram (ECG) recorder and an HRM during typical endurance training in which they had previously detected arrhythmias to verify the diagnosis. Average HRs during exercise was precisely recorded by all types of HRMs. No signs of arrhythmia were detected during exercise in approximately 39% of athletes, and concordant HRs was recorded by the HRMs and Holter ECG. HRMs indicated surprisingly high short-term HRs in 45% of athletes that were not detected by the Holter ECG and were artifacts. In 15% of athletes, single ventricular/supraventricular beats were detected by the Holter ECG but not by the HRM. We detected a serious tachyarrhythmia in the HRM and Holter ECG data with concomitant clinical symptoms in only one athlete, who was forced to cease exercising. We conclude that the HRM is not a suitable tool for monitoring heart arrhythmias in athletes and propose an algorithm to exclude the suspicion of exercise-induced arrhythmia detected by HRMs in asymptomatic, physically active individuals.

Biography

Robert Gajda is the Director and Owner of Center for Sports Cardiology (CSC) at the Gajda-Med Medical Center in Pułtusk, Poland. He is a Cardiologist and a respected Sports Medicine Physician. His main area of research interest includes physiological adaptation to endurance training as well as to extreme endurance efforts. He cooperates with best Polish scientific institutes in this field and is an author or co-author of many papers and lectures including papers published in *Scandinavian Journal of Medicine & Science in Sports and Journal of Cardiology*. He is an active runner and record holder of Polish medics in marathon.

gajda@gajdamed.pl

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