

## ON THE PROBLEM OF DETECTING LOW BURDEN ATRIAL FIBRILLATION IN HEALTHY ATHLETES

### COMMENTS ON: „ABNORMAL P WAVE MORPHOLOGY IN ELECTROCARDIOGRAM IN A HURDLE RUNNER WITH A HISTORY OF PRESYNCOPE -A CASE REPORT”

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This case report address the problem of supra-ventricular arrhythmias in athletes, and offer the intriguing and novel hypothesis that „abnormal P wave morphology in the hurdle runner’s ECG record could potentially be a strong substrate for incidents of supraventricular arrhythmia as a cause of presyncope” (1). In a 12-lead resting ECG and two 24h Holter monitor sessions, no significant incidents of arrhythmia were found.

The plausibility and importance of the above hypothesis is enhanced by a recently reported 10-year prospective study, the aim of which was to evaluate P-wave duration and morphologic characteristics as potential risk markers for the long-term development of atrial fibrillation (AF) in a general population of apparently healthy older adults (age 55-74). The joint occurrence of a notched or deflected P-wave and long P-wave duration ( $\geq 120$ ms) was found to be an important risk indicator for subsequent development of AF (2). This finding, in the light of the above case report (1), suggests that it would be timely and valuable to conduct a similar study in athletes with lone AF.

There is an apparently high prevalence of AF in athletes (3,4). Because most athletes in general have excellent cardiovascular health, and are much younger than the typical AF patient, such a prevalence is not easily explained. Overtraining and subsequent inflammation may be a contributory mechanism (4). Moreover, intensive exercise often induces acute esophageal reflux, and the usual treatment of esophageal acidic exposure with proton pump inhibitors in patients with AF as well as reflux was found, in a few studies, to diminish AF burden (5). The value of any case report of AF in athletes would be enhanced by including appropriate laboratory tests for inflammatory markers and assessment of possible esophageal reflux.

Lone paroxysmal AF (lone PAF), so often found in athletes, may be considered a pure form of AF in contrast to the far more frequent and strongly age-related prevalence of AF with multiple heart disease comorbidities. The pure form may offer a promising research target for determining the origins of AF. It is plausible to assume that the initial onset of lone PAF may typically be asymptomatic and with very low frequency and duration of episodes - i.e. low AF burden (percent of time in AF). Both AF burden and symptoms tend to increase progressively, with possibly many patients remaining asymptomatic.

Studies of elderly AF patients have reported an incidence of asymptomatic AF from 10% to 40%. However, in one small sample of patients with PAF, asymptomatic episodes were 12 times more common than symptomatic AF (6). The rate of asymptomatic PAF cases in an otherwise healthy population of athletes apparently has not been determined, but the above clinically-based AF data suggest that the percentage of asymptomatic cases may be high.

The 48h Holter monitoring in the above case report (1) may not have been adequate to assure detection of brief (<12h) infrequent (<1/week) AF episodes. In any event it is inherently difficult to detect low burden AF, and of course the absence of symptoms would add further to the difficulty.

Continued progress in automating P-wave analysis and AF diagnosis for small Holter and event monitors suitable for use while running or during other sport workouts may contribute to surmounting the difficulty of low-burden detection by making longer monitoring periods practical (7). If P-wave morphology can be truly predictive, as reported in (2), it may be possible to circumvent long monitoring periods. However it will always be difficult to distinguish new onset from a progressive increase in existing low-burden AF.

Apart from any clinical implications of very low AF burden in otherwise healthy athletes, sports medicine researchers should not overlook what may be a unique opportunity to study the origins of such AF 'in statu nascendi' so to speak.

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