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Impact of unsaturated fatty acids on prediction of ventricular fibrillation and paroxysmal atrial fibrillation - importance of eicosapentaenoic acid to arachidonic acid ratio
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Introduction: It is well known that a low ratio of serum eicosapentaenoic acid (EPA) to arachidonic acid (AA) is closely related to cardiovascular events. Also, some studies report that ingestion of fish oil fatty acid significantly reduces potential lethal ventricular arrhythmia (VA) and sudden cardiac death (SCD), but its mechanism is not known. We investigate the relationship between EPA/AA ratio and occurrence of ventricular fibrillation to patients with arrhythmia and control.

Methods: We measured EPA/AA ratio in total 1024 consecutive patients with arrhythmia (atrial tachyarrhythmia (n=511), ventricular tachyarrhythmia (n=155), bradycardia (n=41) and control (n=507)) in our hospital. Mean age is 64±15 years old (606 male). Among ventricular tachyarrhythmia patients, 76 had premature ventricular contraction (PVC), 12 sustained ventricular tachycardia (VT) and 67 ventricular fibrillation (VF). Nineteen of 40 patients with no ischemic VF were without organic heart disease. Among atrial tachyarrhythmia, atrial fibrillation (AF) occurred in 375 patients (200 paroxysmal AF and 175 for inden all patients). BNP level, Hba1c, low-density/high-density lipoprotein ratio, presence of antihypertensive treatment and past history of cerebral vascular disease were observed. We assessed the impact of age on EPA/AA ratio in each arrhythmia group.

Results: EPA/AA ratio in patients with lethal VA (VT or VF) was significantly lower than those with other arrhythmia and control subjects (EPA/AA 0.33±0.19 (patients with lethal VA) vs 0.47±0.35 (control patients); p<0.01). But, general risk factors of cardiovascular disease (CAD) were not different between patients with lethal VA and others. Especially, in patients with VF without organic heart disease, EPA/AA ratio was the lowest among all patients (0.21±0.08). But these patients had significant lower risk factors of CAD than patients with other arrhythmia. Low EPA/AA ratio might be a cause of the occurrence of not only ischemic but also non-ischemic VF patients. Especially, low EPA/AA ratio is closely related in patients with VA without organic heart disease.

Among patients with paroxysmal AF, adults <60 years who have little risk factors for atherosclerotic diseases had significantly lower EPA/AA ratio than that did elderly adults 60yrs (0.31±0.19 vs. 0.46±0.27, p<0.01). Such an age-related difference in the EPA/AA ratio was not found in patients with chronic AF.

Conclusion: Low EPA/AA ratio will be a novel strong predictor for occurrence of VF and paroxysmal AF in patients without organic heart disease.

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Prediction of arrhythmic events by Wedensky modulation in patients with coronary artery disease
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Purpose: Prediction of arrhythmic events (AE) has gained importance with the introduction of medical devices to the Telemedicine center (Campus, Berlin, Germany) for a subsequent evaluation underwent baseline evaluation including measurement of R-/T-wave difference (WMIRT) and LVEF. We showed that ECG recording and immediate transmission of the signal by telemedicine during marathon running is feasible. In general, ventricular and supraventricular arrhythmias were rare during endurance sport in our athletes. We showed that ECG recording and immediate transmission of the signal by telemedicine during marathon running is feasible. In general, ventricular and supraventricular arrhythmias were rare during endurance sport in our athletes.

Methods: In this prospective cohort, 179 patients with CAD referred for AE risk evaluation underwent baseline evaluation including measurement of R-/T-wave difference (WMIRT) and LVEF. Two endpoints were assessed 3 years after the baseline evaluation: sudden cardiac death or appropriate ICD event (EP1) and any cardiac death or appropriate ICD event (EP2). Associations between baseline predictors (WMIRT and LVEF) and endpoints were evaluated in regression models.

Results: Only 3 patients were lost to follow-up. EP1 and EP2 occurred in 24 and 27 patients, respectively. WMIRT (OR per 1 point increase for EP1 20.05, 95% CI 1.82–221.39, P<0.014, and for EP2 73.39, 95% CI 6.67–817.66, P<0.001). LVEF (OR per 1% increase for EP1 0.94, 95% CI 0.90–0.99, P<0.003, and for EP2 0.93, 95% CI 0.89–0.97, P<0.002) were significantly associated with both endpoints. A linear regression revealed a low and significant correlation with the endpoints (P<0.05 for WMIRT controlled for LVEF). The combination of WMIRT >0.60 and LVEF <30% resulted in a positive predictive value of 36.4% for EP1 and 30.9% for EP2.

Conclusions: WMIRT is a significant predictor of AE independent of LVEF and has potential to improve AE risk prediction. However, WMIRT should be evaluated in larger and independent samples before recommendations for clinical routine can be made.

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Prediction of appropriate ICD interventions in patients with the remote myocardial infarction, untreated with amiodarone
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Introduction: We measured LVEF, as tested on first and last hour of running concerning the number of ventricular premature beats (VPB) (Lown classification IIIa) and 117 VPB (Lown classification IV b), including 8 couplets (Lown classification III b) and 117 VPB (Lown classification IV b). In another two athletes 15 polymorphic VPB (Lown classification I). In another two athletes 15 polymorphic VPB (Lown classification I). In another two athletes 15 polymorphic VPB (Lown classification I). In another two athletes 15 polymorphic VPB (Lown classification I). In another two athletes 15 polymorphic VPB (Lown classification I).

Methods: A total of 10 male runners were included in our study and completed a full or a half marathon. No episodes of atrial fibrillation or other arrhythmias could be detected. Two athletes showed less than 10 ventricular premature beats (VPB) during running (Lown classification II). In another athlete 15 polymorphic VPB (Lown classification IIIa) and 117 VPB (Lown classification IV b), including 8 couplets and one triplet were observed, respectively. There was no significant difference between the first and last hour of running concerning the number of ventricular premature beats (3.4±10.8 vs. 1.6±1.4, P = ns), mean heart rate (150.0±32.3 vs. 149.4±37.1 bpm, P = ns), rate corrected QT-interval (44.3±35.7 vs. 43.9±25.2 ms, P = ns). Among the athletes with very high rate variability (HRV) during marathon running (HRV triangular index 11.2±9.9 vs. 10.9±8.5, P = ns), Standard deviation of all NN intervals (SDNN) 85.4±67.0 vs. 109.0±62.7 ms, P = ns.

Conclusion: We showed that ECG recording and immediate transmission of the signal by telemedicine during marathon running is feasible. In general, ventricular and supraventricular arrhythmias were rare during endurance sport in our athletes. In addition, there were no significant changes in ECG parameters during marathon running.

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