

(28,0%) or ventricular (23,9%) arrhythmias. Analyzing the follow ups, we found that older athletes had higher complexity and prevalence of arrhythmias, whereas younger people had higher frequency of arrhythmias in the 24h recordings. Arrhythmic peaks in each of the three age groups were found respectively at 14 ± 2 years, $24 \pm 4,5$ years and $58 \pm 11,1$ yrs. These findings lead us to say that in sports population arrhythmias are a common event and they are often compatible with sports practice.

P4848

Acute coronary occlusion in the out-of-hospital cardiac arrest setting: impact on VF-waveform

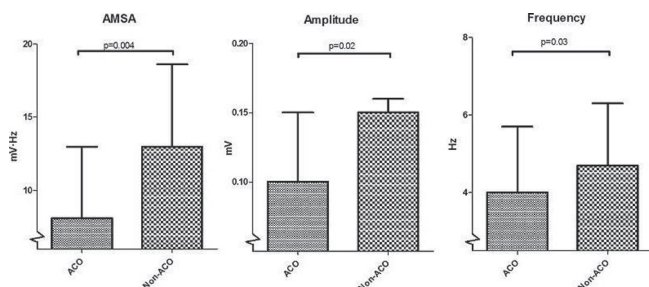
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Background: In many cardiac arrest patients, an acute coronary occlusion (ACO) is the underlying cause of ventricular fibrillation (VF). Driven by its strong association with arrest duration, low frequency-low amplitude VF has become an established marker of poor prognosis. In addition to the impact of time, animal studies have suggested that an ACO also results in low frequency-low amplitude VF. If proven in humans, currently studied "smart defibrillators" may require adjusted algorithms to better guide treatment and prognosis.

Aim: In human cardiac arrest patients, we aim to investigate whether an ACO results in low frequency-low amplitude VF.

Methods: Cohort study of VF patients admitted at a tertiary care university hospital. A clinical panel reviewed underlying aetiology and infarct criteria. Amplitude, frequency and AMSA (Amplitude spectrum area, see Figure) were calculated of the first observed VF-segment on the paddle-ECG (recording direction ~ surface ECG lead II).

Results: Patients with an ACO (n=62) had significantly lower AMSA, amplitude and frequency-related VF characteristics compared to patients without an underlying ACO (n=40, $p < 0.05$ for all VF-characteristics). Analyses on infarct localisation (anterior, inferior) showed the lowest amplitude characteristics in paddle recordings of an inferior ACO. Differences were independent of ambulance response times.



VF waveform measures in relation to ACO

Conclusions: In analogy to animal studies, an acute coronary occlusion led to a lower VF-waveform as compared to patients without coronary occlusion. Our findings imply that the VF-waveform cannot be simply considered a proxy for time, and that recording direction may as well be a future subject of study in the development of "smart" defibrillators.

P4849

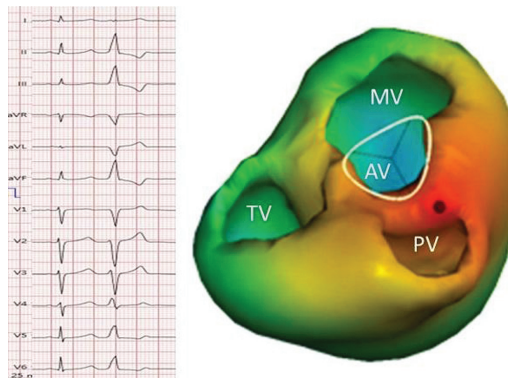
Man vs. machine: comparison of manual vs. automated 12-lead ECG prediction of the origin of idiopathic ventricular arrhythmias to guide catheter ablation

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Introduction: Catheter ablation of frequent idiopathic ventricular arrhythmias (VA) is increasingly performed. While the right ventricular outflow tract (RVOT) has traditionally been the most frequent ablation site, targeting sites also in the left ventricle (LV) has increased over the past years. Preprocedural prediction of the arrhythmia origin from the 12-lead ECG is critical for informed consent and to guide the invasive mapping procedure. Preprocedural prediction however is limited by inter-individual variation in lead position and the orientation of the heart in the chest. In this study, we aimed to prospectively assess the performance of manual vs. automated 12-lead ECG analysis in the prediction of VA origin in the RV as opposed to the LV.

Methods: In a prospective observational cohort study, consecutive patients undergoing catheter ablation of idiopathic VA were enrolled. The VA origin was defined as the site where ablation caused arrhythmia suppression. Patients were excluded if ablation was unsuccessful. A digital 12-lead ECG was recorded at admission for documentation of the VA. All baseline ECG's were analyzed manually by 3 electrophysiologists and 3 EP fellows in a blinded fashion guided by a

previously published ECG algorithm. Similarly, all 12-lead ECG's were analyzed in a blinded fashion using a recently developed fully automated ECG algorithm (Figure). The novel algorithm assumed standard body build and lead placement. **Results:** A total of 54 patients were enrolled. Median age was 48 years (IQR 37–61) and 59% of the patients were female. The VA origin was found in the RV in 33 patients (61%) and in the LV in 21 patients (39%). The automated 12-lead ECG algorithm successfully identified the VA origin in 76% of the patients, which was similar compared to manual ECG analysis performed by the electrophysiologists (median 76%, range 74–80%) and the EP-fellows (median 76%, range 74–78%).



Conclusion: An automated 12-lead ECG algorithm successfully predicts the origin of idiopathic VA in the RV or LV with a similar accuracy as manual expert analysis guided by a previously published ECG algorithm. The accuracy of both manual and automated analysis is limited to 76%, most likely due to inter-individual variation of precordial electrode positions and of the orientation of the heart. Integration of the patient-specific electrode positions obtained with 3D photography might further improve the performance of the automated analysis.

P4850

Variability in the diagnosis of Brugada syndrome

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Aims: Brugada syndrome (BrS) is diagnosed in the presence of a type 1 ECG pattern on ECG. Based on only one study, the definition of this ECG pattern has been enlarged in last guidelines.

Objective: We aim to investigate the impact of this modification in borderline cases.

Methods: Data of consecutive patients referred for BrS to the Nantes University Hospital were reviewed by 2 physicians, blinded to the clinical and genetical status. The first 6 cases of disagreement were presented to 30 residents trained for BrS diagnosis, 154 cardiologist and 5 European Expert in inherited arrhythmia. Number of ECG leads presenting a type 1 ECG pattern, requirement of a sodium channel blocker challenge and indication of ICD implantation were asked for each patients.

Results: Only 58 (38%) general cardiologist but all residents and all expert answer the study. Among those three groups, nor diagnosis, neither number of ECG leads presenting a type 1 ECG pattern, requirement of a sodium channel blocker challenge or indication for ICD implantation was correlated ($r^2 < 0.5$). Interestingly this variability was also observed in each group. The main difficulty was the number of lead presenting a spontaneous type 1 ECG. This led to modify ICD indication in more than 50% of patient even in the expert group.

Conclusion: We demonstrated a huge variability in the interpretation of ECG of Brs patients. This variability lead to variation in the diagnosis and the risk stratification that emphasizes the extreme cautious needed in the interpretation of such ECG.

P4851

Catheter ablation of electrical storm: a single center experience

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Background: Electrical storm (ES) is a life threatening situation. It is defined as 3 or more sustained episodes of ventricular tachycardia (VT), ventricular fibrillation (VF) or appropriate implantable cardioverter-defibrillator (ICD) shocks during 24 hours. Several clinical studies demonstrated the rate of ES about 9–12% after ICD implantation due to both primary and secondary prevention while 7% of patients developed it during first year of follow up. Radiofrequency (RF) ablation of triggering ventricular premature beats or substrate-based catheter treatment