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P26
Post-traumatic stress disorder after acute myocardial infarction- prevalence and predictors

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Introduction: Post-traumatic stress disorder (PTSD) may be found in up to 12% of patients experiencing acute coronary syndrome. We sought to find predictors for the occurrence of PTSD after acute ST-elevation myocardial infarction (STEMI) in consecutive patients treated at our institution.

Methods: We analysed data from the Fribourg STEMI Fast Track Registry (EVALFAST). Starting in June 2008 all patients admitted to University and Hospital Fribourg via the Fast Track managed care system were prospectively enrolled. Relevant patient and procedural data were prospectively collected. Clinical follow-up was performed by phone or clinic visit.

The presence of PTSD was assessed by use of the revised impact of event scale (IES-R) at 1 and 12 months. At 1 month the IES-R was filled out by patients in the presence of a psychotherapist specialized in cardio-psychology. At 12 months the IES-R was mailed to patients for repeated assessment. The PTSD cut-off was set at ≥33 points. Patients with a final diagnosis other than STEMI were excluded from the registry.

The primary outcome was the occurrence of PTSD at 12 months. Patients with PTSD were compared to patients without PTSD. Univariate analysis identified variables associated with the occurrence of PTSD at an alpha < 0.25. All identified variables were entered in a logistic regression model.

Results: Completed IES-R forms were available in 144 patients. The primary outcome occurred in 20 patients (14%). Overall mean age was 63±11 years and 108 patients (75%) were men. The mean total ischemic time was 180min overall and 162min vs. 189min in PTSD and non-PTSD patients, respectively. PTSD patients were younger than their non-PTSD counterparts (56±10 vs. 64±11 years, p=0.01) and more likely to be divorced (30% vs 12%, p=0.03). Four independent predictors for PTSD were identified by binary logistic regression analysis: being employed (OR: 4.25, 95% CI: 1.42-12.7; p=0.01), history of anxiety disorder or depression (OR: 4.44, 95% CI: 1.43-13.8; p=0.01), cardiogenic shock on admission (OR: 6.5, 95% CI: 1.1-38.7; p=0.03) and overweight defined as a BMI of >25 (OR:0.3, 95% CI: 0.1-0.9; p=0.04).

Conclusion: PTSD following STEMI is common. Patients with known depressive or anxiety disorders and those presenting with cardiogenic shock seem to be particularly at risk for developing PTSD after STEMI.

P27
Direct oral anticoagulants versus vitamin K-antagonists for treatment of left ventricular thrombus - Insights from multicenter registry

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Background: For treatment of left ventricular thrombus (LVT), current guidelines recommend vitamin K-antagonists (VKA) targeting an INR goal of 2.0 to 2.5 for up to 6 months, guided by repeated echocardiography. So far, use of direct oral anticoagulants (DOAC) for treatment of LVT had only be reported anecdotally and there remains uncertainty about their efficacy in this setting. We aimed to compare outcomes among patients treated DOACs versus VKAs included in a multicenter registry.

Methods: From an echocardiography database including three teaching hospitals in Switzerland, patients, which were hospitalized and diagnosed with LVTs between 2015 and 2018, were identified and stratified according to their anticoagulation management. Echocardiograms and outcomes were assessed blinded for underlying anticoagulation regimen.

Results: Totally, 53 patients were included, 39 (74%) males, mean age 63±11. LVTs were found in 25 (47%) patients with a recent myocardial infarction, 7 (13%) pa-
tient with ischemic heart disease and 21 (40%) with non-ischemic cardiomyopathy. Mean left ventricular ejection fraction at LVT diagnosis was 32±12%. At hospital discharge, 20 and 33 patients received DOACs or VKA, respectively, whereas 37 (70%) received concomitant antplatelets (triple therapy was established in 9 patients). Median follow-up duration was 20 (interquartile range 6; 35) months. At first available follow-up echocardiogram, 9/20 treated with DOACs versus 19/33 treated with VKAs had no more evidence of LVT (p=0.53). During follow-up, 2 patients treated with VKAs and 1 patient treated with a NOAC died. Among the studied cohort, no major bleedings were encountered.

Conclusions: In a registry-based study, we found no prohibitive signal for use of DOACs for treatment of LVT. This might implicate that DOACs become a valuable alternative for treatment of LVT, especially among patients with high bleeding risk or unstable INR values. However, there is a need for more prospective studies.

P28
Initial experience of ECG screening in pediatric athletes during a popular pedestrian race in Switzerland
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Introduction: Resting electrocardiogram (ECG) based screening has been recommended since 2005 by the European Society of Cardiology for the prevention of sudden cardiac death in young athletes and followed since then by many other sports societies. However, the relevance of this screening strategy and its implementation (population, age, setting) remain debated. The Escalade race in Geneva is the most popular run in Switzerland with ≥50'000 participants, of whom ≥10'000 are < 18 years of age. We aimed to test the value of an ECG-based screening in paediatric athletes participating in this race.

Method: This study is part of a larger Swiss pediatric ECG multicenter prospective cohort (Swiss PAED). Children and adolescents registered for the race were invited to participate by letters sent to clubs and by flyers distributed during the race. All participants gave informed consent. The inclusion criteria were: age 8 to 17 years, ≥6 hours of sports training/week, club affiliation, no known heart disease. During one day, a team of 4 nurses, 3 physiotherapists, and 1 medical student collected the following data: demographics, anthropometrics, sport type, medical history, and resting 12-lead ECG. ECGs were analyzed according to the 2017 international recommendations, classified as normal variants, borderline findings, and abnormal findings, further investigations being performed when appropriate.

Results: A total of 103 pediatric athletes (61 males, mean age 12.5 ± 2.6 years) were recruited. Normal variants were found in 90 (87%) athletes, of which early repolarization (66%) and sinus arrhythmia (50%) were the most frequent. We detected 8 (8%) borderline findings, namely 1 (1%) right axis deviation and 7 (7%) right atrial enlargement, which were not concomitant. Finally, abnormal findings were present in only 2 (2%) athletes: pathologic Q-waves in the inferior leads in an asymptomatic 8-year-old boy and a suspected Brugada pattern in another 10-year-old boy. Further investigations (transthoracic echocardiogram and repeated ECGs) did not reveal nor reproduce any abnormalities.

Conclusion: ECG-based screening in pediatric athletes during popular races may be an opportunity to do mass screening in a short period of time and to detect abnormalities early in young athletes. Further studies are needed to determine whether the 2017 recommendations are appropriate for a pediatric population, and at what age screening should be implemented.

P29
Regular phonation and respiratory muscle training improve respiratory muscle strength and quality of life in patients with structural heart disease - the HeartChoir randomized clinical controlled trial
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Introduction: Most patients with heart failure from acquired or congenital heart disease have reduced exercise capacity. Reduced exercise capacity is associated with reduced respiratory muscle strength. The aim of this study is to investigate whether regular phonation and respiratory muscle training positively influences respiratory muscle strength, exercise capacity and quality of life in this population.

Method: In an interventional, single-centre, open-label, randomized, controlled clinical study of patients with structural heart disease we compared respiratory muscle strength, exercise capacity (MVO2) and quality of life (Minnesota living with heart failure questionnaire) between patients who performed a 12-week intervention including a weekly choir rehearsal and daily breathing exercises and patients who had no intervention. The primary outcome was an improvement of maximal inspiratory pressure (MIP % predicted).

Results: 24 patients (age 65±19 years, 46% male, LVEF 48±13%, NT-proBNP 560 ng/l (278-1272) were randomized. After 12 weeks of daily respiratory training MIP (% predicted) significantly improved in the intervention group (baseline MIP 82±33% predicted versus post-intervention MIP 96±30% predicted, p=0.05) and between both groups (mean change MIP 27.5±9.3% predicted, p=0.008). MVO2 improved in the intervention group (15.6±5.7 versus 19.6±6.9 ml/min/kg, p<0.001 and 68±18% versus 86±23% predicted, p=0.001) whereas between both groups the change was not significant (mean change 8±6% predicted, p=0.2). Quality of life improved in the intervention group (p=0.026) and between both groups (p=0.006).

Conclusion: Regular phonation and respiratory muscle training improve respiratory muscle strength and quality of life in patients with structural heart disease.
P30
Preliminary assessment of smart-meds, an interactive app helping patients to manage medication after an acute coronary syndrome
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Introduction: After an acute coronary syndrome, secondary cardiovascular prevention remains suboptimal. The main challenges for patients are to adopt healthy lifestyle changes and to adhere to prescribed drug therapy. Therefore, we developed “Smart-Meds”, an interactive smartphone app allowing patients to create their own medication plan. They can set reminders for taking their medication, find information about drugs, perform self-assessments by playing a quiz, and consult interactive content about coronary artery disease and cardiovascular risk factors. This app was developed by a multidisciplinary team, in collaboration with patients in a cardiac rehabilitation (CR) program. The main objective of the present study was to evaluate the usability of Smart-Meds in real life and to explore the satisfaction among users.

Method: Voluntary patients entering CR were enrolled to use the app during 4 weeks. At baseline, patients completed questionnaires on demographic data and on medication adherence (SEAMS and BMQ). At 4 weeks, in addition to the SEAMS and BMQ, participants were asked to complete the System Usability Scale (SUS) and to semi-structured oral interview with 9 open-ended questions to explore reasons for satisfaction, app use and potential improvements.

Results: Of the 30 planned patients, we have enrolled 17 patients to date (mean age 58.5 (±6.1) years). All participants installed and used Smart-Meds successfully. Supported by our team, they were all able to create their medication plan by scanning the medication boxes, which they appreciated (Figure P30-1).

Conclusion: Smart-Meds is a promising app, which has been used regularly and easily by patients. Completion of recruitment is necessary to assess the impact on medication adherence. Our final objective is to build a multimodal interactive app evaluating other important parameters such as physical activity, nutrition and smoking cessation.

P31
Pulmonary artery pressure is elevated three month after delivery in patients with preeclampsia and antiphospholipid syndrome
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Introduction: Preeclampsia (PE) is a multisystem disease affecting 2-8% of all pregnancies and accounts for 9 percent of maternal deaths. Recently we found that the prevalence of antiphospholipid syndrome (APS) in PE patients at 13.9%. APS can be the cause of thromboembolic pulmonary hypertension. However, data on heart function and pulmonary pressure in PE and in PE with APS are sparse and incomplete.

Method: Between July 2016 and December 2018, we prospectively performed echocardiography in patients who had suffered from PE alone (n=102, age=32.6±4.8, y) or PE with APS (n=21, age=32.1±4.2, y) 3 months after delivery. APS was diagnosed according to the Sapporo criteria, namely, the presence of one (of 2) clinical criteria (vascular thrombosis or adverse pregnancy outcome) and at least one (of 3) positive antiphospholipid antibodies (anticardiolipin antibody, anti-beta2-glycoprotein, lupus anticoagulant) 12 weeks apart.

Results: Of the 30 planned patients, we have enrolled 17 patients to date (mean age 58.5 (±6.1) years). All participants installed and used Smart-Meds successfully. Supported by our team, they were all able to create their medication plan by scanning the medication boxes, which they appreciated (Figure P30-1).

Conclusion: Smart-Meds is a promising app, which has been used regularly and easily by patients. Completion of recruitment is necessary to assess the impact on medication adherence. Our final objective is to build a multimodal interactive app evaluating other important parameters such as physical activity, nutrition and smoking cessation.
Abstracts

P32
A randomized-controlled study on active commuting to work: effects on cardiovascular risk, exercise capacity, body composition and quality of life
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Introduction: Sedentary lifestyle is a major modifiable risk factor for cardiovascular diseases and triggers substantial costs due to early retirement and the inability to participate in the work force. Active commuting has been proposed to at least in part overcome these problems, however, convincing data to support this recommendation are sparse.

Methods: 73 subjects (age: 46±9 years, 38% males) were 2:1 randomized to an intervention group (IG, n=51) or control group (CG, n=22). Depending on the distance to the work place, IG participants either travelled by a combination of public transport and walking and/or cycling (n=25), or they commuted by walking and/or cycling only (n=26). The CG was asked to commute as usual. Exercise capacity, body composition, everyday physical activity, quality of life, and cardiovascular risk factors were assessed at baseline and after a study period of one year.

Results: Groups did not differ significantly at baseline. Daily self-reported commuting details was verified by GPS-tracking. Subjects in IG changed their commuting habits, whereas CG did not (%of commuting: IG: walking/cycling/public transport: 93%, car: 7%, CG: 54% vs. 46%, p<0.001). Time to commute did not differ significantly. Percentage of age-predicted exercise capacity (IG: 145±25 to 155±31, p=0.001; CG: 142±25 to 136±25%, p=0.058; IG vs. CG: p=0.003) and everyday physical activity (IG: 3756±4150 to 7092±6192, p<0.001; CG: 5251±5076 to 5609±4470 MET-min/week, p=0.539) improved significantly in IG and remained unchanged in CG. In IG but not in CG subjects lost body fat (% of body weight: IG: 34.5±7.7 to 33.2±7.8%, p=0.003; CG: 35.0±9.1 to 34.8±7.4%, p=0.428). Total cholesterol and LDL-cholesterol decreased significantly in IG (5.4±0.9 to 5.0±0.9, p=0.001; 3.0±0.8 to 2.7±0.9mmol/l, p=0.001), and remained unchanged in CG (5.2±1.0 to 5.0±0.9, p=0.195; 3.1±0.8 to 2.7±0.9mmol/l, p=0.735). Cardiovascular risk profile (HeartScore) in these relatively healthy subjects remained essentially unchanged (p>0.05 for both groups). In quality of life assessment (SF-36), general health (p=0.008), vitality (p=0.003) and mental health (p=0.012) changed significantly in IG, but no significant changes were noted in CG (p=0.05). No serious adverse events occurred during the study.

Conclusions: Our results indicate that active commuting to work may counteract certain downsides of a sedentary lifestyle without prolonging the time-period of the commuting to work substantially.

P33
Value-based PCSK9-inhibitor prices derived from fixed QALY-based and individual LDL-based models
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Background: Value-based personalized drug prices (PEP) instead of fixed price models (QALY) may avoid rationing of expensive drugs.

Method: We compare a value-based pricing for gains in quality of life (QALY) using a fixed price model and for potentially avoidable events based on expected LDL effects in a personalized price model (PEP) applied to a primary care population with prognostically relevant carotid atherosclerosis applied to LDL lowering drugs including PCSK9-inhibitors.

Results: In the average Fourier or Odyssey patient, Evolocumab and Alirocumab were overpriced by 68% and 71% per QALY and were overpriced by 80% and 83% respectively according to the PEP model. Expected benefits from population-wide lipid lowering with statins and PCSK-9 inhibitors combinations in those with high CVD risk (20% or more) based on posttest-calculations derived from carotid atherosclerotic burden and their observed LDL at baseline (4.14 mmol/l) would avoid 7371 cardiovascular events per year in Switzerland.

Conclusion: PCSK9-inhibitors are overpriced by 68% to 83% in Switzerland. The huge potential of LDL lowering in high-risk primary and secondary care patients would avoid 7371 cardiovascular events in Switzerland annually. New financing concepts should be developed in order to avoid rationing of these highly effective drugs. One way would be a world-wide concept regarding a statal sales guarantee for a certain period at value-based costs per drug unit. This might prevent that pharmaceutical companies do establish toxic prices at the beginning of new product sellings, in order to protect them from income losses.

P34
Early starting age of endurance training is associated with a higher aortic distensibility
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Introduction: Aortic distensibility (AD) has been found to be higher in endurance trained athletes compared to healthy sedentary controls. AD has also been found to be positively related to left ventricular (LV) function. We have previously reported a younger age at start of endurance training in athletes with eccentric LV hypertrophy (LHV) compared to those with concentric LHV in a cohort of male, middle-aged, non-elite endurance athletes. We speculated that the beneficial effects of an early starting age on LV morphology may be extrapolated to AD.

Methods: A total of 121 healthy, normotensive, Caucasian participants of a 10-mile race were recruited and assessed with an echocardiogram and a comprehensive interview. Aortic systolic and diastolic diameters were measured on 2D-echocardiograms, and AD calculated with simultaneously measured pulse pressure (PP) derived from systolic and diastolic blood pressure (BP). Athletes were classified based on their LV geometry patterns. Linear models were calculated for AD with parameters of LV that showed significant univariate correlations with AD. Likewise, a model for AD was performed with training parameters showing a significant univariate correlation with AD.

Results: Ninety-two athletes had sufficient echocardiogram quality of the aorta and were used for analysis. Of these, 28 (30%) had LHV, of whom 14 had eccentric and 14 had concentric LHV. In the model with LV parameters (LV mass index, LV end-diastolic volume index, resting HR), only resting HR remained significant in explaining the variance of AD. Of the training variables, only age at start of endurance training was significantly (inversely) related to AD. AD was not related to age. In the subgroup with LHV, athletes with eccentric LHV had greater AD, smaller diastolic aortic diameter, lower diastolic BP, higher PP, lower resting HR, and greater LV end-diastolic volume index than athletes with concentric LHV. They had a younger age at start of endurance training and a greater cumulative endurance training volume. The two groups did not differ in age, systolic BP, LV mass index, or yearly endurance training volume.

Conclusions: In our cohort of non-elite middle-aged runners, AD was significantly related to age at start of endurance training, with those starting during adolescence having higher AD, lower resting HR, and greater LVEDV. Amongst athletes with LHV, those with eccentric LHV had significantly higher AD than those with concentric LHV.

P35
Symptoms and quality of life in patients with coexistent atrial fibrillation and atrial flutter
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Introduction: Atrial fibrillation (AF) and atrial flutter (AFL) are the two most common atrial arrhythmias and often coexist. Many patients with AF or AFL are symptomatic, which impacts their quality of life (QoL). However, little is known about the potential additive burden caused by coexistent AF and AFL.

Methods: We combined baseline data from two large prospective, observational, multicenter cohorts (BEAT-AF and Swiss-AF). All 3931 patients included in this analysis had previously documented AF. We obtained information on medical history (including history of coexistent AFL and arrhythmia-related interventions), comorbidities, medication, and lifestyle factors. All participants had a clinical examination and a resting ECG. Symptom burden and QoL at the baseline examination were compared between patients with and without coexistent AFL using multivariable adjusted regression models.

Results: Overall, 809 (20.6%) of the 3931 patients had a history of AFL. Patients with coexistent AFL more often had a history of heart failure (28% vs 23%, p = 0.01), coronary artery disease (30% vs 26%, p = 0.007), unsuccessful therapy with antiarrhythmic drugs (44% vs 29%, p < 0.001), and more often underwent AF-related interventions than patients with AF only (36% vs 17%, p < 0.001). They also were more often symptomatic than patients with AF only (70% vs 66%, p = 0.04). Coexistent AFL was significantly associated with effort intolerance (OR: 1.14; 95% CI: 1.01 - 1.28; p = 0.04). AFL directly documented on the baseline study ECG was associated with more symptoms (OR: 2.30; 95% CI: 1.26 - 4.20; p = 0.007) and a lower health perception on a visual analog scale (β-coefficient -9.70, 95% CI: -13.56 - -5.84; p < 0.001) compared to AF patients who were in sinus rhythm at the time of enrolment.

Conclusion: Our data show that patients with coexistent AF and AFL are more often symptomatic and report poorer quality of life than patients suffering from AF only.