S10.1

Mean heart rate from 24-h Holter recordings predicts total mortality in heart failure patients

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Purpose: To estimate electrophysiological indices derived from non-invasive electrocardiographic and echocardiographic screening as total mortality (TM) predictors for heart failure (HF) patients.
Methods: We screened 279 HF patients (age: 67 ± 13.0, male: 83%, NYHA: 2.4 ± 0.5, LVEF: 31.4 ± 10.1, CAD: 80%, DCMP: 20%) under optimum treatment and with ECG, SAECG, ECHO, and 24 h Holter (HM). After 14.8 ± 13.3 months of follow-up, 48 deaths occurred (sudden cardiac deaths: 16, pump failure deaths: 26, non-cardiac deaths: 6). Differences of non-invasive markers between survivors and non-survivors analysed with log rank test. The correlation of the non-invasive markers with mortality was searched through survival analysis method utilizing Kaplan–Meier—survival curves adjusted for possible confounders under building of appropriate Cox statistical models.
Results: After Cox regression model analysis adjusted for gender, age, LVEF, VPBs/24 h, NSVT episodes/24 h, mean heart rate, and QTc interval, the only important and independent predictor of TM was mean heart rate (HR; 24 h) presented HR: 1.044 ($P = 0.007$, 95% CI: $1.011-1.077$).
Conclusions: Mean HR predicted TM in HF patients importantly and independently of gender, age, LVEF, VPBs, NSVT, and QTc. A cut-off point of HR > 70.5 bpm (50th percentile) presented sensitivity 58% and specificity 51% for predicting TM.

S10.2

The prognosis investigation in patients with chronic heart failure and pericardial effusion

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Background: Researchers still do not reach the consensus on the incidence, characters, and the prognostic value of pericardial effusion (PE) in patients with chronic heart failure (CHF).
Methods: A total of 1189 patients, with a diagnosis of CHF consecutively admitted to three centres, were enrolled. M-mode echocardiography was used to determine the presence or absence of PE and to semi-quantify it. One hundred and eighteen patients with PE and 472 without were followed up. The relationship between the PE and other parameters and the prognostic value of PE for CHF were analysed by univariate and multivariate analyses.
Results: After follow-up, 550 patients were analysed; of which, 226 were death. The incidence of PE was 9.92%. Moderate PE was most common which account 90.68% (107 of 118), 6.78% (8/118) had small while only 2.54% (3 of 118) had large one. The systolic blood pressure [OR = 1.04, 95% CI (1.01, 1.07), $P = 0.08$], LVEF [OR = 1.09, 95% CI (1.02, 1.15), $P = 0.06$], and MPAD [OR = 1.51, 95% CI (1.24, 1.85), $P < 0.001$] were the independent predictors of PE. The GFR [OR = 1.013, 95% CI (1.005, 1.026), $P = 0.02$], systolic blood pressure [OR = 1.02, 95% CI (1.00, 1.03), $P = 0.015$], LVEF [OR = 1.08, 95% CI (1.04, 1.12), $P \pm 0.001$] and diabetes mellitus [OR = 2.53, 95% CI (0.99, 6.44), $P < 0.001$] were determined as the independent predictors of CHF prognosis.
Conclusion: The PE is not uncommon in CHF patients and most PE are small to moderate. Pericardial effusion is not related to the aetiology of CHF while is strongly connected with higher systolic blood pressure, lower LVEF, and larger MPAD. Pericardial effusion dose not add the death risk of CHF patients.

S10.3

Diastolic function and exercise capacity in heart transplant recipients

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Background: Diastolic function has been proposed to limit the exercise capacity in heart transplant recipients.
Aim: To correlate resting diastolic function by echocardiography with walked distance in 6-min walking test and exercise variables in cardiopulmonary exercise test (CPX).
Methods: Ten subjects with 4 ± 1.4 years of heart transplant were recruited to perform a resting echocardiography and a CPX (modified Naughton protocol).
Results: E/E (5.5 ± 0.6) did not correlate with walked distance (0.15 ± 0.04 miles) ($r = 0.02$, $P = 0.57$), peak VO_2 (22 ± 5.5 mL KgO_2 min) ($r = 0.05$, $P = 0.88$), VO_2 at respiratory compensation point (19.6 ± 6 mL KgO_2 min) ($r = 0.18$, $P = 0.6$), SLOPE VEVCO2 (28.7 ± 3.7) ($r = -0.08$, $P = 0.82$), time CPX (14 ± 3.8min) ($r = -0.14$, $P = 0.69$). Right ventricle (22.5 ± 3.2 mm) did not correlate with walked distance ($r = 0.28$, $P = 0.93$), peak VO_2 ($r = 0.35$, $P = 0.31$), VO_2 at respiratory compensation point ($r = -0.4$, $P = 0.25$), SLOPE VEVCO2 ($r = -0.14$, $P = 0.69$), time CPX ($r = -0.36$, $P = 0.3$). Diastolic diameter of the left ventricle (46.8 ± 2.7 mm) did not correlate with walked distance ($r = 0.06$, $P = 0.8$), peak VO_2 ($r = -0.31$, $P = 0.37$), VO_2 at respiratory compensation point ($r = -0.31$, $P = 0.38$), SLOPE VEVCO2 ($r = -0.41$, $P = 0.23$), time CPX ($r = -0.26$, $P = 0.46$). Left atrium (41 ± 9 mm) did not correlate with walked distance ($r = 0.4$, $P = 0.24$), peak VO_2 ($r = -0.43$, $P = 0.21$), VO_2 at respiratory compensation point ($r = -0.43$, $P = 0.21$), SLOPE VEVCO2 ($r = 0.23$, $P = 0.51$), time CPX ($r = -0.42$, $P = 0.50$).
Conclusion: Resting diastolic function does not seem to limit exercise capacity in heart transplant recipients.

S10.4

The relationship between red cell distribution width with clinical characteristics: analysis based on 11 486 chronic heart failure patients with different causation

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Background: Red cell distribution width (RDW) has recently been ascertained to be a novel prognostic marker in patients with chronic heart failure (CHF). However, the relationship between RDW and clinical characteristics is not elucidated. This study was designed to investigate the relationship between RDW with clinical characteristics in CHF patients with different causation of CHF.
Methods and results: A total of 11 486 patients with CHF were collected from 12 hospitals in HuBei province in China. Patients were divided into different groups according to the causation of CHF. The univariate and multivariate analyses between the RDW and clinical characteristics were performed in all groups. The RDW was 14.269 ± 2.0415 in all patients. In multiple linear regression analysis, right ventricular diameter (RVD) in dilated cardiomyopathy (β-coefficient 0.109, $P = 0.021$), rheumatic heart disease (β-coefficient 0.283, $P = 0.014$), and hypertension heart disease (β-coefficient 0.489, $P = 0.013$) was independently correlated with RDW. In coronary heart disease, male (β-coefficient 3.008, $P = 0.006$), age (β-coefficient 0.124, $P = 0.040$), NYHF classification (β-coefficient 1.674, $P = 0.039$), and RVD (β-coefficient 0.108, $P = 0.016$) were independently correlated with RDW. However, in pulmonary disease, alcoholic cardiomyopathy and hyperthyroid cardiomyopathy, no parameter was independently correlated with RDW.
Conclusion: Red cell distribution width has closely relationship with the clinical characteristics in patients with CHF. The relationship is associated with different causation of CHF.

S10.5

Single-centre experience on intrathoracic impedance monitoring in chronic heart failure patients

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Background: The Medtronic InSync Sentry is the first available CRT-D with automatic fluid status monitoring via measuring intrathoracic impedance. This study was designed to observe the effectiveness of intrathoracic impedance monitoring on detecting aggravation in chronic heart failure patients.

Methods: We retrospectively analysed the clinical data of 14 consecutive patients. Patients were regularly followed up every 3–6 months after the implantation. At each visit, interrogation of the device was done by specified doctors. Patients were instructed to inform the researcher in case of a device alert, and to take extra 40 mg of furosemidum if they really had aggravated symptoms later. If the symptoms could not be relieved by 40 mg of furosemidum, they were asked to see a doctor. Data about heart failure hospitalization was collected retrospectively from the medical record.

Results: During 18–48 month follow-up, a total of seven patients encountered 28 alert events. On one hand, alert events appeared before all deteriorated symptoms and heart failure hospitalizations. On the other hand, there were 23 (82.1%) alerts followed by deterioration of heart failure symptoms, and 2 (7.1%) alerts related to two hospitalizations caused by pulmonary infection rather than heart failure deterioration in one patient. Only five patients were hospitalized 10 times for deterioration of cardiac function.

Conclusions: The function of intrathoracic impedance monitoring can predict decompensation of cardiac function with satisfying specificity and sensitivity. Intervention immediately after an alert event may prevent acute aggravation of heart failure to the greatest extent.