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Topic 3. Cardiomyopathies, heart failure, athletes, hypertension

Poster n°31

Evaluation of non-invasive myocardial work in Takotsubo cardiomyopathy

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Introduction Tako-tsubo cardiomyopathy(TTC) is characterized by transient left ventricular(LV) wall motion abnormalities(WMA). However, whether systolic performance fully recover is unclear. Non-invasive myocardial work (MW) is a new index of global and regional myocardial performance never described in this setting.
Objective To assess global and regional MW in apical TTC.
Method 50 patients with typical TTC(mean age 77 ± 10 y, 47 women) were prospectively enrolled and underwent a transthoracic echocardiography within 24 h of admission and a median of 32 days at follow-up. MW is derived from the non-invasive strain-pressure loop obtained from the 2D strain data, integrating non-invasive arterial pressure. Constructive MW(CMW), MW index(MWI), MW efficiency(MWE), and wasted work(WW) were measured. Hospital complications(HC) were defined as a composite of heart failure, right ventricular extension, and LV apical thrombus. A control group of 24 patients matched for age and sex without overt cardiovascular disease served as a comparative group.
Results In the TTC group, global and regional MW improved significantly between the two examinations (global, regional apical and medial CMW, MWI, MWE, WW, and regional basal CMW, and MWI, all $P < 0.01$). The acute apical—basal gradient of MW inverted at FU. In TTC, global CMW and MWI were significantly correlated to acute LV systolic function parameters, and were significantly impaired in patients with HC($n = 13$, all, $P < 0.01$). At FU, despite total recovery of WMA, global and regional MW was significantly reduced in TTC by comparison to the control group ($P < 0.01$ for all components), although hemodynamics, LV ejection fraction, and 2D global longitudinal strain were similar (all P = NS).
Conclusion Global and regional myocardial performance is transiently impaired in typical TTC and significantly associated to HC. Despite total recovery of WMA, subtle dysfunction of myocardial performance persist at FU.

Disclosure of interest The authors declare that they have no competing interest.

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Poster n°32

Structural state of the cardiovascular system in patients with hypertension and chronic obstructive pulmonary disease

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Introduction The risk of cardiovascular complications and mortality in patients with hypertension increases in the presence of comorbid diseases. The prevalence of hypertension in patients with chronic obstructive pulmonary disease (COPD) of 34.3%. The aim: to study the structural state of the heart based on echocardiography in patients with hypertension and COPD.
Method 58 stable patients with stage II hypertension (H) were examined. 26 patients had comorbid COPD categories A-C. The patients were divided into two groups: Gr I included patients with H and COPD ($n = 26$), Gr II - patients with H ($n = 32$). Gr I consisted of 15 men and 11 women ($P > 0.05$), mean age - 57.0 (9.5) years. H of degree 1 was determined, in 11 - degree 2, in 10 patients - degree 3. Gr II consisted of 18 women and 14 men ($P > 0.05$), the average age was 51.0 (8.1) years. 8 people had H of 1 degree, 2 degrees - 14, 3 degrees - 10 patients. An electrocardiographic study of the heart was carried out. Program Statistica 10.0 was used.
Results Left ventricular ejection fraction in Gr I was 55,6(42,0;60,0)%, in Gr II -64,0(56,5;71,5)% ($P = 0,02$). Left atrium in Gr I was 3,9(3,4;4,4) sm, in Gr II- 3,5(3,2;4,0) sm ($P = 0,02$). EDV in Gr I was 139,5(118,5;147,6), in Gr II-145,0(123,9;158,5) ($P = 0,03$). ESV in Gr I was 43,5(32,0;57,0), in Gr II-46,4(37,1;55,5) ($P = 0,4$). ESD in Gr I -3,8(3,3;4,1), in Gr II-4,2(3,4;4,7) ($P = 0,8$). Mean pulmonary artery pressure in Gr I -33,0(25,0;40,0) mm Hg, in Gr II-22,5(20,4;28,7) ($P = 0,002$).
Conclusion The presence of comorbid COPD leads to the development of pulmonary hypertension followed by dilatation of the left atrium and the formation of left ventricular systolic dysfunction. Hypertension contributes to an increase in cardiovascular risk, and therefore this cohort of patients needs the earliest possible compre-

hensive assessment of the structural and functional state of central hemodynamics.

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Poster n°33

Improvement of atrial and ventricular strain after cardioversion of persistent atrial fibrillation

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Introduction We aimed to detect early atrial morphologic and functional changes after successful electric cardioversion of atrial fibrillation (AF) and to correlate them to alterations of left and right ventricular strain

Method All patients with successful electric cardioversion of persistent AF were included in a prospective monocentric study between August 2018 and August 2019. They had a transthoracic echocardiography before cardioversion (TTE 1) and 2 months later (TTE2). Left atrial (LA) and ventricular volumes, left ventricular ejection fraction (LVEF), left and right ventricular global longitudinal strain (GLS), LA strain and ejection fraction (LAEF) were measured. Recurrent AF was ruled out by a 24-hours ECG monitoring after 2 months

Results We included 29 men and 7 women 66 +-9.7 yo, with CHA2DS2VASC Score 2.5 (0-8),AF lasting for 21.2 ± 27.7 months and LVEF 53.7 ± 14.7%. At 2 months follow-up, sinus rhythm was maintained in 28 patients (78%). Patients with recurrent AF had no modification of volumes and function when comparing TTE 1 and TTE2. Patients with sustained sinus rhythm improved their LA volume (TTE1: 43 ± 14.5 ml/m^2; TTE2: 34.5 ± 13 ml/m^2; $P = 0.001$), LAEF (TTE1: 38.4 ± 15.7%; TTE2: 61.4 ± 15.7%; $P = 0.0001$) and LA strain (TTE1: 13.8 ± 7.4%; TTE2: 30.7 ± 17.5%; $P = 0.0001$). The left ventricular GLS (TTE 1: -12 ± 5%; TTE 2: -19.1 ± 5.6%; $P = 0.0001$) and right ventricular GLS (TTE 1: -10 ± 4.5%; TTE2: -17.6± 4.5%; $P = 0.0001$) were also improved while there was no significant change in LVEF (TTE 1: 55.5 ± 15.8%; TTE2: 59.1 ± 10.8%; $P = 0.128$). There was a correlation between LA strain changes and left ventricular GLS improvement ($r = 0.53$; $P = 0.001$) and between left and right GLS improvements ($r = 0.6$; $P = 0.0001$)

Conclusion Sinus rhythm maintenance after AF cardioversion is associated to early improvement of, not only LA volume and function, but also left and right ventricular strain

Disclosure of interest The authors declare that they have no competing interest.

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Poster n°34

Prevalence and factors associated with dyspnea in adult patients with Hemoglobin SC disease: a study of 221 cases

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Introduction Sickle cell disease is the most frequent genetic hemoglobinopathy worldwide and early childhood mortality has dramatically decreased in high-income countries. However, in the aging sickle cell disease population, the morbidity related to chronic organ damage, especially kidney and heart, has become a major concern. The disease is well characterized in homozygous SS patients, but the complications associated with Haemoglobin SC disease (HbSC) are mostly unknown. Dyspnea is frequent in SS patients and associated with poor quality of life, this symptom was not investigated in HbSC patients. Our objective is to investigate the prevalence and the factors associated with dyspnea in HbSC patients.

Method A total of 221 HbSC patients (mean age 35 years, 47% men) were prospectively investigated. Clinical and biological data were collected, and 109 (49%) patients underwent an echocardiography.

Results A dyspnea was observed in 28 (13%) patients. Compared to the rest of the cohort, these patients were older and had a lower hemoglobin level ($P < 0,001$). In the subgroup with echocardiographic examination, the left ventricular (LV) ejection fraction was preserved in all the patients. An LV diastolic dysfunction was diagnosed in 25 (23%) patients, 10 had dyspnea and 15 were asymptomatic ($P = 0.06$). In multivariable analysis, age (Odds ratio 0,94 [0,91—0,97]) and hemoglobin level (1,74 [1,17—2,58]) were independently associated with dyspnea (Fig. 1).

Conclusion Dyspnea is relatively uncommon in adult HbSC patients and related to age and hemoglobin level. Cardiac involvement seems not to be a major factor associated to dyspnea in HbSC patients.

	All patients		NYYHA ≥2		NYHA = 1		P value
	N	Mean (SD)	N	Mean (SD)	N	Mean (SD)	
LVEDD index (mm/m²)	107	27 (3)	26	26 (3)	81	28 (3)	p = 0,08
LVM index (g/m²)	100	82 (18)	23	83 (21)	77	81 (17)	p = 0,77
Left Ventricular hypertrophy n(%)	100	11 (11%)	23	4 (17%)	77	7 (9%)	p = 0,27
Cardiac output (L/min/m²)	104	3,1 (0,7)	25	3,2 (0,6)	79	3,1 (0,6)	p = 0,80
Left Ventricular Ejection Fraction (LVEF) (%)	109	62 (6)	26	62 (5)	83	62 (6)	p = 0,95
Left atrial Volum index (mL/m²)	102	35 (9)	26	33 (10)	76	35 (8)	p = 0,43
E/A ratio	106	1,5 (0,7)	26	1,3 (0,5)	80	1,6 (0,8)	p = 0,06
Averaged E/é	95	6,7 (1,7)	26	7,1 (2,1)	69	6,5 (1,9)	p = 0,12
TRV (m/s)	94	2,3 (0,2)	22	2,4 (0,3)	72	2,3 (0,2)	p = 0,19
TRV > 2,5m/s	94	10 (11%)	22	3 (14%)	72	7 (10%)	p = 0,69
TRV > 2,9m/s	94	1 (1%)	22	1 (5%)	72	0 (0%)	p = 0,23
TAPSE (mm)	101	25 (5)	26	26 (4)	75	25 (5)	p = 0,52
Diastolic dysfunction n(%)	109	25 (23%)	26	10 (38%)	83	15 (18%)	p = 0,06

Figure 1 SD: Echocardiographic characteristics. Standard deviation; LVEDD: Left Ventricular end-diastolic diameter; LVM: Left Ventricular Mass; TRV: Tricuspid regurgitation velocity; TAPSE: tricuspid annular plane systolic excursion.

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Poster n°35

Accuracy of echocardiography for detecting cancer therapeutics-related cardiac dysfunction

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