**How does left ventricle affect left atrium in obese patients with atrial fibrillation and heart failure and preserved ejection fraction?**

According to the multiple, studies atrial fibrillation (AF) is driven by the overlapping of inflammation, atrial remodeling, and oxidative stress that accompany obesity, however the role of the left ventricle (LV) structure and function remains unclear in particularly this group of patients (pts).

**Purpose.** To assess the impact of LV structure and function changes, on the development of AF in obese patients with heart failure and preserved ejection fraction (HFpEF).

**Materials and methods.** We examined pts with clinical signs and symptoms of HFpEF NYHA II-III; and divided them into 4 groups: 1st group (gr) - with body mass index (BMI) < 30 kg/m2 and sinus rhythm (SR) and AF; 2nd – BMI ≥ 30 kg/m2 and SR; 3rd - BMI < 30 kg/m2 and AF; 4th - BMI ≥ 30 kg/m2. Echocardiography with tissue Doppler was performed to all of pts, levels of N-terminal prohormone of brain natriuretic peptide) NT-proBNP were measured. Ventricular-arterial coupling (Ea/Es) was calculated using arterial and ventricle elastance ratio.

**Results.** 87 pts (49 pts with SR and 38 pts with AF) formed 4 groups (30 vs 19 vs 19 vs 20 pts relatively) that didn’t differ (all p>0,05) in age (66,7±9,9 vs 63,5±11,8 vs 68,4±13,4 vs 63,9±7,3), gender (19 (63,3%) vs 11 (55%) vs 15 (78,9%) vs 14 men (70%)), LV EF ( 56,6±6,6 vs 54,5±4,3 vs 55,2±4 vs 52,7±5,5) and had evenly distributed compensated non-cardiac comorbidities. We obtained statistically significant differences in investigated parameters between patients with SR and AF, with more severe impairments in presence of latter together with obesity. The correlation between Ea/Es and LAVI was found in the 3rd and 4th gr, and between LVMMI and LAVI in the 4th gr. The results are shown in the table.

**Conclusions.** Obese patients with AF and HFpEF have more significant LV hypertrophy and impairment of LV diastolic function in comparison to patients with SR. Impaired ventricular-arterial coupling ratio inversely correlates with LAVI in pts with AF, independently on BMI and stroke volume index (SVI); and LVMMI directly correlates with LAVI in obese pts with AF, independently on SVI, that make it possible to assume the leading role of LV DD in development of AF in pts with HFpEF.

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| Parameter | Group 1 | Group2 | Group 3 | Group 4 | P value |
| LAVI | 38,3±4,1 | 41,2±5,3 | 52,2±7,4 | 44,8±9,7 | p<0,001# |
| SVI | 39,9±5,4 | 40,6±4,7 | 37,4±13,2\* | 43,3±7,4\*\* | p<0,05 |
| LVMMI | 155,3±22,9 | 157,1±26,5 | 160,1±26,7 | 178,8±35,6\*\*§ | p<0,05 |
| Ea/Es | 0,75±0,21 | 0,75±0,12 | 0,85±0,25§ | 0,86±0,21\*\*§ | p<0,05 |

\*- differences with gr 1 are statisticaly significant; \*\*- with gr 2; \*\*\*- gr 3; #- multiple comparisons; §-direct correlation with LAVI;