## Summary

The efficiency of the entire cardiovascular system depends on effective relaxation of the left ventricle (LV) during the diastolic period. The development of LV diastolic dysfunction (LVDD) is a long-term process that leads to elevated LV filling pressures and subsequent symptoms in the form of worsening exercise tolerance and to clinical symptoms of heart failure (HF).

LVDD is increasingly recognized as an independent predictor of cardiovascular events, therefore its determinants are being intensively investigated. The prevalence of LVDD varies widely, ranging from 9% to 39.1%, depending on the population studied and definition used. Classic risk factors for diastolic dysfunction include age, obesity, diabetes mellitus, hypertension and LV hypertrophy, but may vary depending on the characteristics of the studied population.

The chronic coronary syndrome (CCS) population as well as the general population - individuals without severe cardiovascular disease, underwent echocardiography to assess the prevalence of LVDD and a number of clinical and laboratory tests.

The prevalence of LVDD in the group with CCS was 38,5%. Those with LVDD had higher WHR ($p=0.046$) and PWV ($p=0.003$). The group had higher NT-proBNP ($p<0.001$) and hs-TnT ($p=0.018$) levels on laboratory examination and had worse prognostic echocardiographic parameters. In logistic regression analysis, a higher ratio of android to gynoid adipose tissue remained positively associated with LVDD ($p=0.030$) after model adjustment for age, sex, NT-proBNP and hs-TnT. In logistic regression analysis with stepwise variable elimination, the strongest factors associated with LVDD were both body composition parameters such as WHR ($p=0.038$) or handgrip strength ($p=0.024$) and PWV ($p=0.019$).

In the general population - without severe cardiovascular disease, the $LVDD_{2016}$ prevalence was 5,4%. This group had the highest BMI ($p=0.001$), larger neck ($p<0.001$), waist ($p<0.001$) and hip ($p=0.002$) circumferences, compared to the other groups. Groups without LVDD, with $LVDD_{1998}$ and $LVDD_{2016}$ were significantly different in parameters of hs-TnT ($p=0.010$), NT-proBNP ($p=0.022$). Logistic regression analysis after adjustment for age, gender, LVEF and BMI showed a positive relationship between $LVDD_{2016}$ and diastolic BP ($p=0.010$), hs-CRP ($p=0.039$), hs-TnT ($p=0.044$) and cortisol ($p=0.010$). Logistic regression analysis with stepwise variable elimination proved that independent factors associated with

$LVDD_{2016}$ were BMI (p=0.003), hs-CRP (p=0.016), hs-TnT (p=0.006), LVEF (p=0.035) and neck (p=0.024) and waist (p=0.014) circumference.

The prevalence of LVDD in the population with CCS is 38.5%. In this group, pulse wave velocity is positively associated with LVDD. The effect of abdominal obesity on LVDD is stronger than that of obesity defined by BMI. Furthermore, among individuals with CCS, lower muscle strength and lower bone density are associated with LVDD, suggesting a potential role for physical fitness as a protective factor against diastolic dysfunction.

The prevalence of LVDD in the general population is 5.4%. Obesity indices, both BMI, abdominal obesity (defined by waist circumference) and neck circumference can be used to detect individuals at increased risk of LVDD in this group. Increased hs-TnT levels are associated with the presence of LVDD, which may indicate a poorer prognosis. In the general population, an inflammatory marker (hs-CRP) independently of obesity is associated with LVDD.