SUPPLEMENTAL MATERIAL

Role of left ventricular diastolic pressure (LVDP) in the subendocardial viability ratio (SEVR) assessment

The relationship between difference in SEVR values assessed with invasive catheterization and carotid transcutaneous tonometer by "traditional" method has been deepened. In this context, the role of LVDP in the SEVR assessment has been investigate (Figures S1-S4), since the "traditional" method completely ignores the role of LVDP in estimating SEVR.

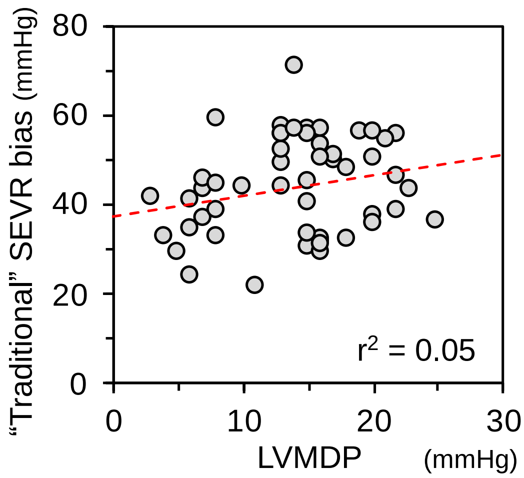

Figure S1 – Effect of the mean value of left ventricular diastolic pressure (LVMDP) on the bias between subendocardial viability ratio (SEVR) values estimated with carotid transcutaneous tonometer by "traditional" method and SEVR assessed with invasive catheterization.

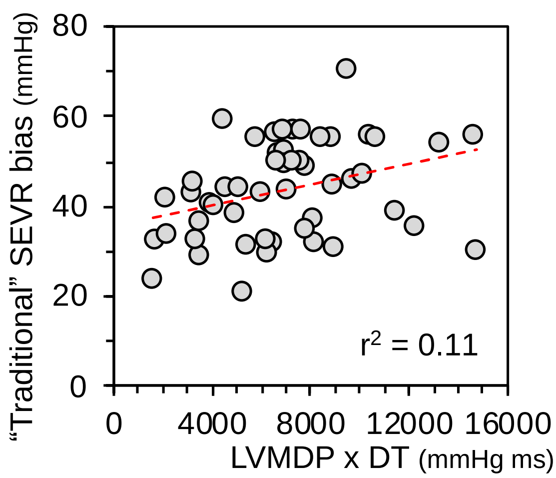

Figure S2 – Relationship between difference in subendocardial viability ratio (SEVR) values assessed with invasive catheterization and carotid transcutaneous tonometer by "traditional" method and the area related to left ventricular mean diastolic pressure (LVMDP). The latter has been calculated as LVMDP measured by invasive catheterization multiplied by diastolic time.

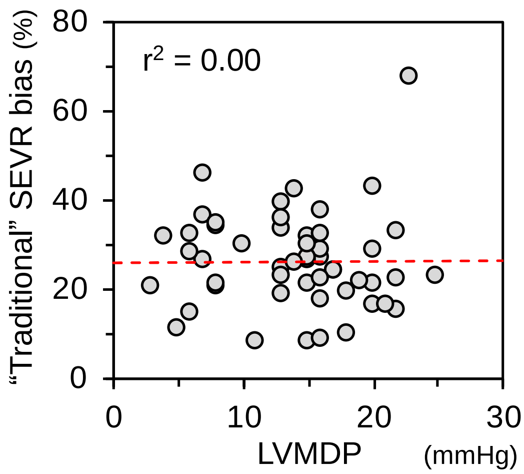

Figure S3 – Effect of the mean value of left ventricular diastolic pressure (LVMDP) on the percentage of bias between subendocardial viability ratio (SEVR) values estimated with carotid transcutaneous tonometer by "traditional" method and SEVR assessed with invasive catheterization.

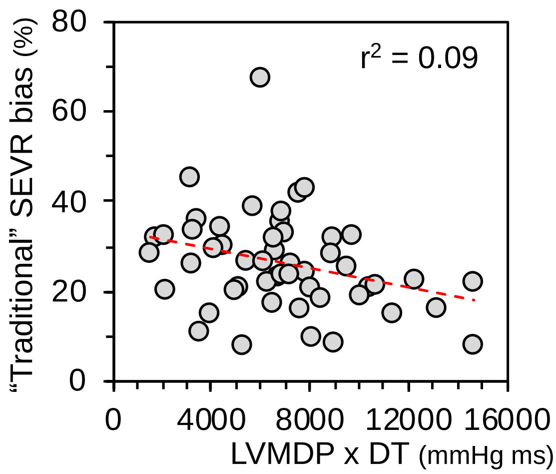

Figure S4 – Relationship between percentage difference in subendocardial viability ratio (SEVR) values assessed with invasive catheterization and carotid transcutaneous tonometer by "traditional" method and the area related to left ventricular mean diastolic pressure (LVMDP). The latter has been calculated as LVMDP measured by invasive catheterization multiplied by diastolic time.

Thus, the SEVR estimated with carotid transcutaneous tonometry by “traditional” method was modified, subtracting the area related to LVMDP (measured invasively) in the evaluation of the diastolic pressure-time index (DPTI) (Figure S5).

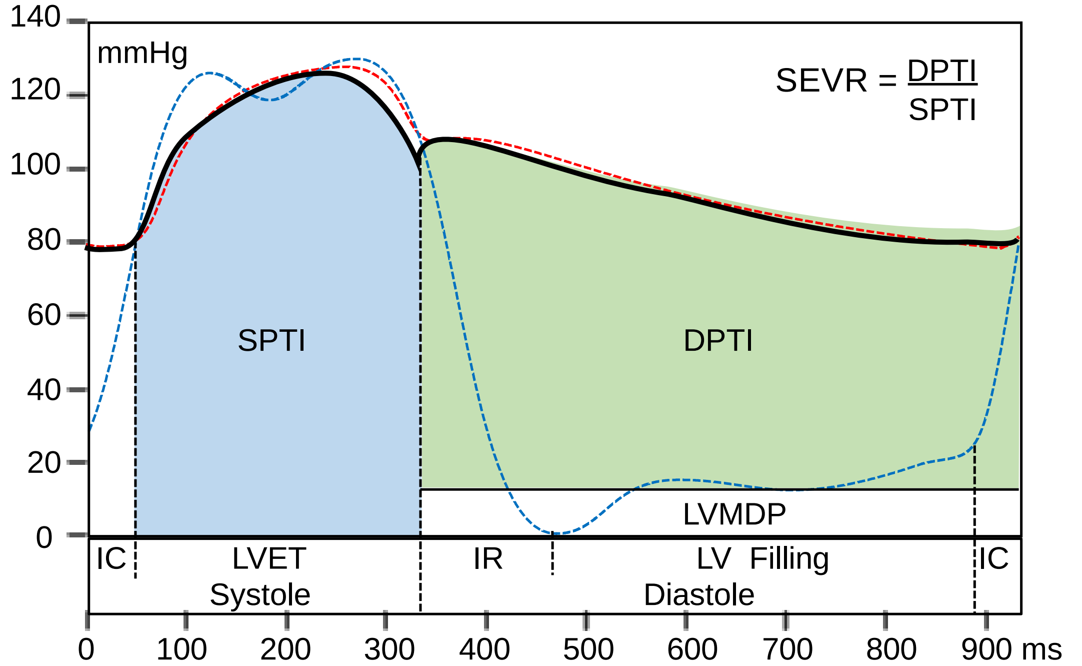

Figure S5 – Subendocardial viability ratio (SEVR) estimated with carotid transcutaneous tonometry by “traditional” method taking into account the role of the left ventricular mean diastolic pressure (LVMDP). DPTI is estimated by subtracting the area relative to the LVMDP, determined on the integral of the ventricular pressure curve in diastole recorded by ventricular catheterization from the area below the carotid pressure curve in diastole (i.e. DPTI according to the "traditional" tonometric method). The figure shows the ventricular pressure curve (dashed blue line) and the aortic pressure curve (dashed red line), recorded with invasive catheterization, and the carotid pressure curve (solid black line), recorded by applanation tonometry. IC, isovolumic contraction time; IR, isovolumic relaxation time; LVET, left ventricular ejection time; SPTI (blue area), systolic pressure-time index; LV Filling, left ventricular filling time.

However, also considering LVDP, the SEVR values estimated with the tonometric "traditional” method always appear significantly higher than the real SEVR values measured with the invasive method (Figure S6): mean difference ± 1.96 SD of the differences = 23.1 ±16.3 (limits of agreement: from 6.8 to 39.4).

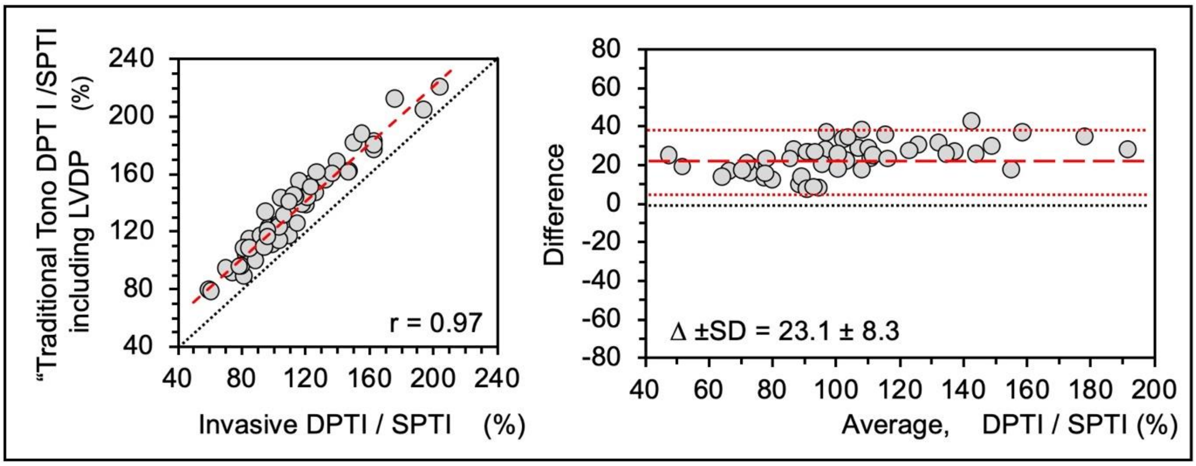

Figure S6 – Relationship between subendocardial viability ratio (SEVR=DPTI/SPTI) estimated with carotid transcutaneous tonometry by "traditional" method taking into account the role of the left ventricular diastolic pressure (LVDP) and measured with invasive catheterization. On the right panel, Bland-Altman plot shows differences observed between invasive and non-invasive measurements of SEVR according to the average values. The area delimited by dotted lines shows the mean values of differences (dashed lines) ±1.96 standard deviation of mean values. In the tonometric assessment, diastolic pressure-time index (DPTI) is estimated as mean diastolic blood pressure minus LVDP multiplied by diastolic time. SPTI, systolic pressure-time index; r, correlation index; SD, standard deviation.

Relationship between left ventricular end-diastolic pressure (LVEDP) and left ventricular mean diastolic pressure (LVMDP).

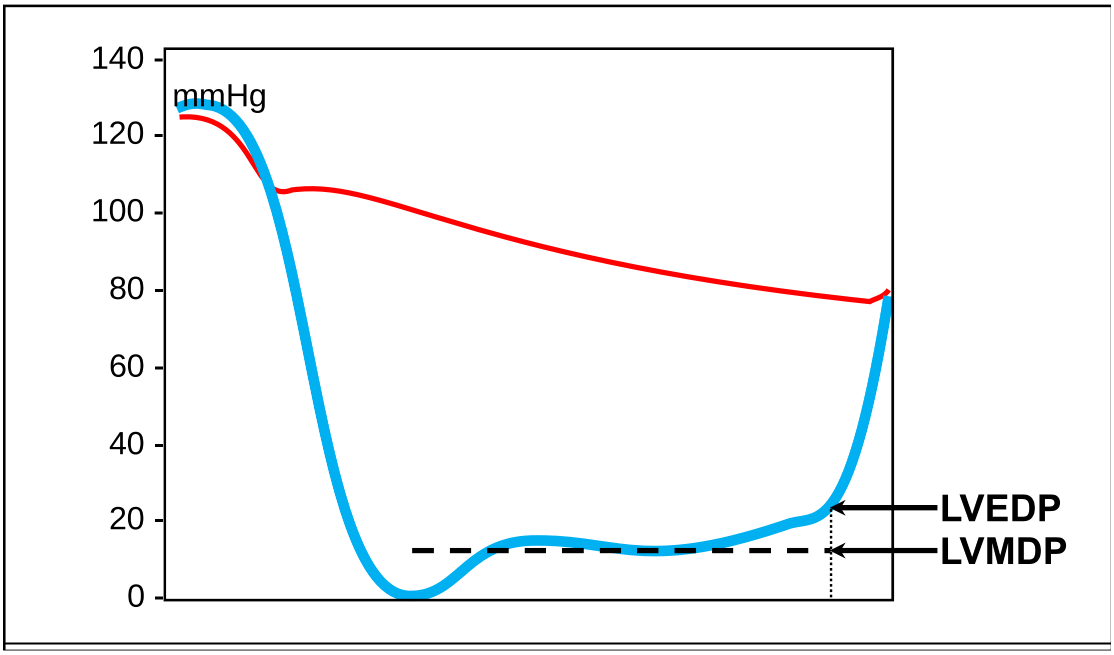

Figure S7 – Left ventricular end-diastolic pressure (LVEDP) and left ventricular mean diastolic pressure (LVMDP). LVEDP represents the pressure that precedes the rapid rise of the pressure in systole. LVMDP is defined by the integral of the filling diastolic phase of the left ventricle, from the end of the isovolumic relaxation phase, to the beginning of the isovolumic contraction phase.

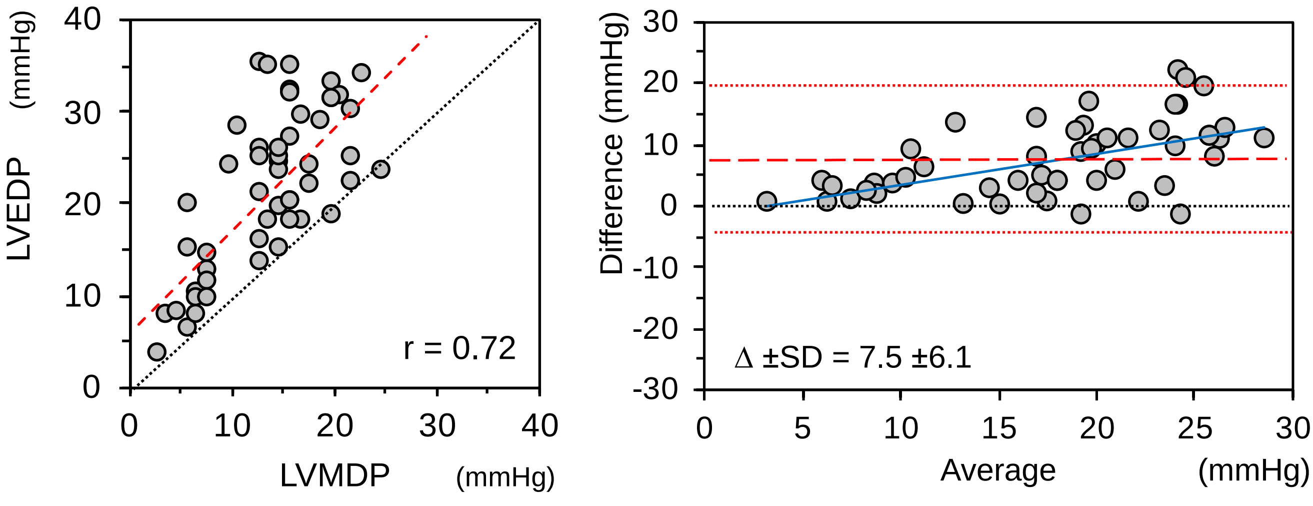

Figure S8 – Relationship between invasive measurements of left ventricular end-diastolic pressure (LVEDP) and left ventricular mean diastolic pressure (LVMDP). On the right panel, Bland-Altman plot shows differences observed between LVEDP and LVMDP according to the average values. The area delimited by dotted lines shows the mean values of differences (dashed lines) ±1.96 standard deviation of mean values. r, correlation index; SD, standard deviation.