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Correlation between endothelial dysfunction and myocardial damage in acute phase of Tako-Tsubo cardiomyopathy: Brachial flow mediated dilation as a potential marker for assessment of patient with Tako-Tsubo

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Tako-Tsubo cardiomyopathy (TTC) is characterized by transient systolic ventricular dysfunction. It is supposed to be caused by a catecholaminergic wave which leads to myocardial stunning through a massive action on beta2-adrenoreceptor. Moreover, beta2-receptor hyperactivity negatively influences endothelial function. It can be detected by brachial flow mediated dilation (b-FMD) which assesses endothelium regulated vasomotility. The study aim is to analyze the b-FMD variability during hospitalization in 50 patients admitted with TTC. In addition, we investigated a possible correlation between b-FMD at admission and both length of hospital stay (LOHS) and troponin I peak. We detected b-FMD by measuring the hypoxic induced vasore activity through assessing brachial artery dilation after 5 min of iatrogenic ischemia obtained by inflating a sphygmomanometer cuff. Artery diameter modifications were assessed by high-resolution ultrasound, and dedicated software calculated accurately the percentage of dilation after ischemia by comparing it to the basal. These values were measured at admission and on discharge. The obtained values were compared for each patient to explore their variability during hospitalization. Moreover, the correlation between the b-FMD at admission and both the troponin I peak and the LOHS was investigated. There was a statistical significant difference between mean FMD measured at admission and at discharge (respectively 1.54±0.34 and 8.92±2.48%; $p<0.001$). Moreover, we found a significant negative correlation between troponin I peak and FMD values at admission ($r = - 0.7645$; $p<0.001$) and a significant inverse correlation between FMD at admission and LOHS ($r = - 0.7543$; $p<0.001$). There is a significant improvement of b-FMD during hospitalization in patients admitted for Tako-Tsubo Cardiomyopathy. Moreover, for the first time, a direct correlation among b-FMD, troponin I peak and LOHS has been detected.

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