

# Value of Diastolic Stress Echocardiography Combined with Speckle Tracking Imaging in Assessment of Patients with Exertional Dyspnea and Normal Resting Left Ventricular Functions

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## **BACKGROUND:**

A group of patients presenting with exertional dyspnea and a preserved left ventricular ejection fraction (LVEF) have a normal resting left ventricular (LV) filling pressure which increases with exercise or stress due to diastolic dysfunction.

## **OBJECTIVES:**

We aimed to study the value of diastolic stress echocardiography combined with speckle tracking imaging in assessment of patients with exertional dyspnea and normal resting LV functions.

## **PATIENTS:**

We prospectively studied 200 patients their age  $\leq 60$  years who had unexplained exertional dyspnea and unable to do exercise test including those with (severe physical or mental inability, morbid obesity, recent stroke, etc) all patients included in the study had a normal both LV systolic function (LVEF  $\geq 50\%$ ), and diastolic function by conventional echocardiography.

## **METHODS:**

all patients were subjected to a standard DSE protocol with incremental dobutamine infusion rates of 5, 10, 20, 30, and 40 mg/kg/min each stage lasts for 3 minutes, and the following LV echo parameters were recorded at baseline and at peak dose of the DSE; LVEF, (E/e') it is the

ratio between early mitral inflow velocity and mitral annular early diastolic velocity, also two-dimensional speckle tracking imaging (2D-STI) was done to measure LV global longitudinal systolic strain (GLS), global longitudinal diastolic strain rate (DSr) during early filling (DSrE), late diastole (DSrA).

## **RESULTS:**

The study included 200 patients their mean age  $45.7 \pm 8.4$  years (60% were males). The LVEF, and the GLS showed non-significant difference at baseline compared to peak dose DSE (P=0.81, 0.73 respectively), the E/e', DSrA and E/DSrE were significantly increased from baseline to peak study (p < 0.001, 0.003, and 0.006 respectively), while DSrE was significantly decreased at peak stress (p < 0.001), and the E/DSrE, and DSrE were significantly correlated to E/e' (p < 0.001)

## **CONCLUSIONS:**

DSE combined with global diastolic strain rate parameters are valuable methods to evaluate diastolic dysfunction in patients with exertional dyspnea and normal resting myocardial functions.

## **KEY WORDS:**

Dobutamine stress echocardiography; Two-dimensional speckle tracking, Strain rate imaging; Diastolic dysfunction.