

(Research Article)

**Evaluation of strain and strain rate parameters using two-dimensional speckle-tracking echocardiography in patients with coronary artery disease**

**Z.A. Ahmadi<sup>1,2</sup>, M. Mokhtari Dizaji<sup>\*2</sup>, A. Sadeghpour<sup>3</sup>, H. Khesali<sup>3</sup>, A. Firouzi<sup>4</sup>**

1. Student Research Committee, Faculty of Medical Sciences, Tarbiat Modares University

2. Department of Medical Physics, Faculty of Medical Sciences, Tarbiat Modares University

3. Echocardiography Research Center, Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences

4. Cardiovascular Intervention Research Center, Rajaie Cardiovascular Medical and Research Center, Iran University of Medical Sciences

Received: 2021/08/13, Accepted: 2021/09/30

**Abstract**

The study aimed was to measure left ventricular (LV) strain using speckle tracking echocardiography (STE) for assessment of LV function. Eighty-two subjects (mean age  $57\pm 9$  years) with suspected chest pain underwent two-dimensional (2D)-echocardiography before coronary angiography. Conventional echocardiographic parameters were used for the assessment of LV function. Longitudinal strain and its strain rate (SR) and circumferential strain, and its SR with 2D-STE were calculated for the assessment of myocardial function. According to the angiography results, patients were divided into two groups: CAD patients ( $n=60$ ) and healthy group ( $n=22$ ). There was a significant decrease in longitudinal and circumferential strain and strain rate in patients with CAD compared to healthy individuals (longitudinal strain in patients  $-16.2\pm 2.4$  vs  $-19.5\pm 2.1$  for a healthy group) ( $P\text{-value}<0.05$ ). Discriminate analysis of longitudinal and circumferential strain with values of 78% and 83% indicated the highest sensitivity respectively. ST as a non-invasive method for measurement of strain and strain rate parameters is proposed in the early diagnosis of LV dysfunction in patients with CAD.

**Keywords:** Strain, Left ventricular function, Speckle tracking echocardiography.

pp. 9-18 (In Persian)

---

\* Corresponding author E-mail: mokhtarm@modares.ac.ir