МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ`Я УКРАЇНИ
ХАРКІВСЬКИЙ НАЦІОНАЛЬНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ
КАФЕДРА ПРОПЕДЕВТИКИ ВНУТРІШНЬОЇ МЕДИЦИНИ №1,
ОСНОВ БІОЕТИКИ ТА БІОБЕЗПЕКИ

Науково-практична конференція

«РЕАЛІЇ, ПРІОРИТЕТИ ТА ПЕРСПЕКТИВИ ВНУТРІШНЬОЇ МЕДИЦИНИ»,

присвячена 125-річчю кафедри пропедевтики

внутрішньої медицини №1, основ біоетики та біобезпеки

МАТЕРІАЛИ КОНФЕРЕНЦІЇ

Харків, Україна
18 квітня 2018 року

ЗМІСТ

MYOCARDIAL STRAIN PARAMETERS IN EVALUATION OF LEFT VENTRICULAR CONTRACTILITY

Ashcheulova T., Honchar O., Kopytsya M., Tytarenko N., Yukhnovskyi O.
Kharkiv National Medical University

Determination of the treatment strategy in patients with coronary artery disease as well as those with chronic heart failure is largely dependent on the state of left ventricular contractility. A number of different methods to evaluate the latter have been proposed over the years, with the one integrated index being used the most widely to estimate the left ventricular systolic function – its ejection fraction (EF, the relation of stroke volume to the end diastolic volume). Having shown the strongest associations with outcomes among the parameters previously used, EF in some cases leads to an underestimation of the severity of cardiac dysfunction due to inherent limitations of the method. To increase accuracy in assessing left ventricular functional capacity, a number of new methods have been proposed.

The most widely introduced and validated techniques for assessing LV contractility during the recent years is the estimatoin of strain and strain rate – parameters of mechanical deformation of the cardiac muscle. This method allows the estimation of myocardial mechanics by measuring the distance between the points within the heart wall during the cardiac cycle. When the distance between the two points is increasing (relaxation of the myocardium during diastole), strain values are positive. When two points move towards each other (shortening muscle fibers during systole), strain decreases, and the values of the strain rate become negative. Strain and strain rate can be obtained by analyzing the myocardial movement in tissue doppler mode, but this approach has major disadvantages. The most significant of them are high sensitivity to scanning angle, increased level of parasitic noise and artifacts, which hinder the analysis, as well as the impossibility of evaluating these parameters in a direction perpendicular to the scan axis. The alternative to tissue doppler echocardiography is to calculate the strain and strain rate based on speckle-tracking technology, which uses the identification of unique points in the thickness of the myocardium in the grayscale mode of the imaging and trace their movement throughout the cardiac cycle.

The most informative and best reproduced myocardial deformation parameter is the Global Longitudinal Strain (GLS), which, according to a number of authors, is more sensitive than EF in the quantitative assessment of LV systolic function and can be used to identify subclinical myocardial dysfunction in case of different genesis of dilated cardiomyopathies. In addition, GLS can be used to monitor patients undergoing chemotherapy to detect a decrease in the function of the heart at an early stage, prior to lowering the values of EF. The intersegmental variability of the time-to-peak of local strain is a direct parameter of mechanical dyssynchrony that is proposed for use in evaluation of the risk of ventricular arrhythmias. The increasing acknowledgement of GLS diagnostic value has led to its iclusion to the latest internationalconsensus documents on cardiovascular imaging.