



Egyptian Society of Cardiology  
The Egyptian Heart Journal

www.elsevier.com/locate/ehj  
www.sciencedirect.com



ORIGINAL ARTICLE

# Impact of pre-excitation syndrome on left ventricular systolic function and cardiac synchronization assessed by tissue Doppler imaging and speckle tracking techniques



Salah Atta <sup>a,b,\*</sup>, Hatem Abdalrahman <sup>a</sup>, Mohamed Bashandy <sup>b,c</sup>, Amro Sayed <sup>a</sup>

<sup>a</sup> Cardiology Department, Assiut University, Egypt

<sup>b</sup> Cardiology Department, Saud Albabtain Cardiac Center, Al-Dammam, Saudi Arabia

<sup>c</sup> Cardiology Department, Damietta Branch, A-Azhar University, Egypt

Received 18 June 2013; accepted 27 September 2013

Available online 7 November 2013

## KEYWORDS

Pre-excitation syndrome;  
Dyssynchrony;  
Left ventricular dysfunction

**Abstract** *Background:* The pathogenic mechanism for the development of left ventricular (LV) dysfunction in patients with asymptomatic pre-excitation syndrome has not yet been fully elucidated. We sought to assess the impact of pre-excitation on LV systolic function and whether the use of tissue Doppler imaging (TDI) and speckle tracking is more helpful in detection of the LV dyssynchrony than conventional echo parameters in these patients.

*Methods:* This observational case control study was carried out on adults with manifest pre-excitation syndromes. A detailed echocardiographic assessment was performed including TDI and speckle tracking examination.

*Results:* Our study patients were divided into two groups, group 1: with lateral accessory pathways (AP) (23 patients aged  $31.65 \pm 6.5$  years), group 2: with septal AP (25 patients,  $34.84 \pm 10.8$  years). Echocardiography showed a lower ejection fraction (EF) in group 2 than in group 1 ( $0.60 \pm 0.07\%$  in group 1 vs.  $0.50 \pm 0.08\%$  in group 2,  $p = 0.000$ ). The radial strain dyssynchrony index was higher in group 2 than in group 1 ( $58.78 \pm 33.47$  vs.  $139.52 \pm 21.14$  ms;  $p < 0.0001$ ) with a significant negative correlation with EF ( $r = -0.8$ ,  $p = 0.000$ ). Dyssynchrony detection was higher using speckle tracking technique than M mode/Doppler methods ( $p = 0.006$ ).

\* Corresponding author at: Saud Albabtain Cardiac Center, Al-Dammam, Saudi Arabia. Mobile: +966 502900623.

E-mail address: [salah\\_s\\_atta@hotmail.com](mailto:salah_s_atta@hotmail.com) (S. Atta).

Peer review under responsibility of Egyptian Society of Cardiology.

**Conclusion:** Patients with pre-excitation syndrome may have depressed LV function unrelated to tachyarrhythmia, especially if the AP has a septal location. This dysfunction may be associated with the LV dyssynchronous contraction caused by pre-excitation. The use of TDI and speckle tracking echocardiographic techniques may be associated with an increase in the identification of manifest pre-excitation patients with significant LV dyssynchrony.

© 2013 Production and hosting by Elsevier B.V. on behalf of Egyptian Society of Cardiology.

## 1. Introduction

Left ventricular (LV) dysfunction has been described in patients with accessory pathways (AP). Although prospective studies are lacking, small case series show that LV dysfunction in these patients may progress over time.<sup>1,2</sup> The use of more recent and advanced echocardiographic techniques, such as tissue Doppler imaging (TDI) or speckle tracking echocardiography, was suggested to be used to improve the ability of detecting patients with WPW who have LV dysfunction in asymptomatic patients with right-sided septal accessory pathways.<sup>3</sup>

At present, the pathogenic mechanism for the development of LV dysfunction and dilated cardiomyopathy (DCM) in patients with asymptomatic pre-excitation has not yet been fully elucidated.<sup>4</sup> Recognizing pre-excitation as a cause for LV dysfunction is pertinent as it is reversible. Most reports have shown reversal of LV dilatation and restoration of LV function.<sup>5,6</sup> Recovery of cardiac function after radiofrequency ablation occurs over a variable period. Recovery as early as weeks to as late as 1.5 years has been reported. Interestingly, a septal or paraseptal accessory pathway has been documented in most patients with overt ventricular pre-excitation who developed LV dysfunction or DCM in the absence of recurrent tachyarrhythmias. This finding suggests that the location of the accessory pathway is an important feature in the pathogenesis of this disorder. However, the studies done in this aspect are still limited and still require more research to confirm this finding.

## 2. Aim of the work

We sought to assess the impact of pre-excitation on LV systolic function in relation to the location of the accessory pathway (AP) and whether the new echocardiographic techniques as tissue Doppler imaging (TDI) and speckle tracking are more helpful in detection of the LV dyssynchrony than conventional echocardiographic parameters in these patients.

## 3. Patients and methods

This observational case control study was carried on adult patients recruited from Cardiology Department, Faculty of Medicine, Assiut University, Egypt and Saud Alabtain Cardiac Center, Al-Dammam, KSA in the period between June 2009 and April 2013.

Included patients had manifest pre-excitation diagnosed by the surface 12-lead ECG using the following criteria: Short PR interval less than 120 ms during sinus rhythm. QRS complex exceeding 120 ms with a slurred, slowly rising onset of QRS complex in some leads (Delta wave). Secondary ST-T wave

changes that are generally directed in an opposite direction to the major delta and QRS vectors.<sup>7</sup>

Exclusion criteria were: the presence of frequent palpitations, any significant organic heart disease, pericardial disease, pulmonary disease, alcoholism, neuromuscular disease, renal failure, malignancy or any systemic disease that may be associated with left ventricular dysfunction.

The study was approved by the Institutional Ethics Committee, and all patients gave their written informed consent at enrollment.

All patients were subjected to complete medical history, physical examination, chest X-ray and conventional 12-lead electrocardiogram (ECG). We predicted AP location using two published and well accepted algorithms for localization of AP location from the pre-excited ECG.<sup>8,9</sup> This was applied by two independent investigators (this localization was confirmed by electrophysiologic study (EPS) in the cases done for risk stratification.

The patients were divided into two groups. Group 1 included patients with ECG localization of lateral APs (whether left or right lateral) to be compared with another group (Group 2) with a septal location of AP. All patients had 24 Hours ECG (Holter) monitoring as a part of their assessment to rule out significant arrhythmia as well as a part of the risk stratification of the AP.

## 4. Echocardiographic examination

Echocardiographic assessment was performed in all patients and each examination included using an M-mode, two-dimensional, pulsed Doppler modalities as well as TDI and speckle tracking examination, all under continuous ECG tracing (Vivid 7, Vingmed – General Electric, USA). M-mode tracings were obtained at the level of the papillary muscles in the parasternal long axis or short axis views and measurements were performed according to the American Society of Echocardiography recommendations.<sup>10</sup>

The following measures were obtained in all patients: left ventricular end-systolic and end-diastolic dimensions, left ventricular fractional shortening, ejection fraction (EF%) using Simpson's biplane method and dyssynchrony indexes. All measurements were done 3 times and a mean was calculated. The examinations were done and analyzed by two observers.

LV function was categorized according to the guidelines of the American Society of Echocardiography<sup>10</sup> as normal if the EF is > 55%, mildly abnormal if EF is 45–54%, moderately abnormal if 30–44%, and severely abnormal if EF is < 30%.

Dyssynchrony indexes were calculated as follows:

M-mode index:

Septal-to-posterior wall motion delay (cut-off value = 130 ms): the measurement was obtained from the M-mode

Download English Version:

<https://daneshyari.com/en/article/2910599>

Download Persian Version:

<https://daneshyari.com/article/2910599>

[Daneshyari.com](https://daneshyari.com)