SUBCLINICAL CARDIAC DYSFUNCTION IN RHEUMATOID ARTHRITIS

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Rheumatoid arthritis (RA), the most common systemic autoimmune disease is a disabling disease. It decreases the lifespan of the affected by approximately 4 years in men and 10 years in women. Cardiac involvement is the most common reason for reduced survival in RA [1]. Patients with RA have an approximately 2-fold higher incidence of congestive heart failure (CHF) as compared to the general population [2]. CHF is an independent risk factor for mortality in RA patients and is responsible for 1 in 8 deaths of patients with RA [3]. Diastolic Dysfunction (DD) is an important entity that serves as a precursor to systolic and diastolic CHF. It also contributed to morbidity and mortality independently. The higher incidence of CHF in RA reinforces our attention to its precursor forms and preclinical assessment, and therefore highlights the need to study DD in patients with RA.

The prevalence of diastolic dysfunction in RA is approximately 37% [4]. Diastolic dysfunction is an echocardiographic diagnosis though cardiac MRI and radionuclide ventriculography are other alternatives. The superiority of echocardiography in comparison with other advanced imaging techniques is the ready accessibility and real time imaging [5, 6].

Echocardiographic evaluation of diastolic function traditionally involves the measurements of transmittal flow parameters, which includes the E and A diastolic filling velocities, the E/A ratio, and the E deceleration time (DT) from an apical 4 chamber. Analysis of 8 studies published [7] between years 1999 and 2013 showed that the most common index of diastolic function used was E/A ratio. Meta analysis of nearly 21 studies published till now have showed evidence of DD based on the presence of at least one of increased deceleration time or IVRT or lower E/A ratio. Prolonged IVRT was the most likely abnormality found in DD in patients with RA in these studies [8]. In the present study, E and E/A ratio were found to be not different in RA compared with the control group in contrast to the previous studies. This probably could be explained by the fact that mitral flow velocity detected by Doppler echocardiography is affected by many factors like heart rate, preload, and after load. In fact, new Doppler parameters were developed to overcome these limitations in the evaluation of mitral flow diastolic functions and Tissue Doppler imaging (TDI) is one of them.

This is the first study to use TDI technique in patients with RA to assess silent cardiac involvement despite the introduction of TDI way back. In the previous studies using TDI [9,10] only Em/Am ratio was assessed, and the results of this study is concordant with the present study. In this study Em/Am ratio, TAPSE, IVCT, IVRT, AT, IVV, IVA , Pm, Ea and Aa were found to be lower in RA patients than that in the control group, which supports diastolic dysfunction in patients with RA. This is the first study in literature to use TDI with all its parameters for assessment of diastolic function in patients with RA.

Limitation of this study is the subjects recruited being small in number. However, this limitation does not underscore the value of the primary end point of early detection of DD in RA by TDI. This study should be considered as a pilot study and further studies should be carried on with utilization of TDI in RA for assessment of early cardiac involvement.

A major deviation of the finding in this study is the correlation between diastolic dysfunction and duration of RA. The previous studies have shown the association between DD and duration of RA. A significant but weak inverse relationship between the ratio of the E to A ventricular filling velocities (E/A) ratio and the disease duration ($p<0.05$, $r=-0.385$) was noted. Although the strength of the relationship was weak ($r=-0.385$), there was convincing evidence to support disease duration as a clinical predictor of diastolic dysfunction in RA [7]. A trend towards deterioration of diastolic function with disease duration was noted. Liang et al [11] remarked that the above association remained significant even after adjustment for traditional cardiovascular risk factors. Researchers hypothesize that ongoing subclinical myocardial inflammatory process in RA might contribute to impaired myocardial function. A role of IL6 and TNF-α has been suggested and plasma

levels of these correlated with diastolic dysfunction [11-13]. The only exception was a study by Montecucco et al [14] which found no association between these 2 variables and showed that E/A ratio in RA correlated with age. The present study also did not show any correlation between diastolic dysfunction and duration of RA with 1 year as the cut off. However, this probable requires a separate study where the primary endpoint should be to correlate the relation between duration and diastolic dysfunction and longer duration follow up is probably required.

This is an important study that reemphasizes the need for early detection of cardiac involvement in RA to enable early management. This study highlights the fact that TDI is a better parameter for assessment of diastolic dysfunction in RA patients even before the appearance of symptoms. Whether this diastolic dysfunction is reversible or halted with early initiation of treatment for RA with disease modifying drugs is an important issue to be assessed in future studies.

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