Invited Editorial / *Davetli Editöryal Yorum*

The role of speckle-tracking imaging in cardiac evaluation of patients with end-stage liver disease

Benek takibi görüntülemenin son dönem karaciğer hastalarının kardiyak fonksiyonlarının değerlendirilmesindeki rolü

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Liver disease is an important cause of morbidity and mortality worldwide.[1] Alcoholic and non-alcoholic fatty liver disease are among the main causes of cirrhosis in industrialized and Western countries, whereas viral hepatitis is the leading cause in Asian countries. Liver transplantation remains the only solution in end-stage liver disease (ESLD). Worldwide, among solid organ transplantations, the liver is the second most commonly transplanted organ.[2] Chronic liver disease is a systemic disease and influences almost all organ systems, including the cardiovascular system. Diseases related to liver disease and the cardiovascular system can be classified into 3 groups: liver dysfunction due to cardiac pathologies, cardiac dysfunction due to liver pathologies, and systemic diseases causing both cardiac and liver problems.[3]

Patients with ESLD may develop cardiomyopathy due to cirrhosis characterized by electrophysiological abnormalities (mainly prolongation of QT), systolic and diastolic dysfunction, and high output physiology.[3] Heart failure symptoms are not evident at rest; however, under conditions of stress, cardiac function is revealed to be impaired.[4]

The criteria for the diagnosis of cirrhotic cardiomyopathy were determined by Møller et al.[5] It has been defined as the absence of known cardiac disease, the presence of impaired contractile responsiveness to stress, and/or altered diastolic relaxation with electrophysiological abnormalities.[6] Evaluation of cardiac function is an important issue in ESLD patients, both before and after liver transplantation. Although cardiovascular abnormalities may fully recover after liver transplantation, identification of patients prone to develop cardiac failure in the post-transplantation period is crucial in terms of achieving global treatment goals. This article will shed light on a novel method to evaluate cardiac functions in patients with ESLD. Demirtas Inci et al.[7] investigated the utility of the speckle-tracing imaging (STI) method of diagnosing subclinical impairment of cardiac functions in patients with ESLD. Forty patients with ESLD were enrolled and compared with 26 healthy individuals, with no primary cardiac disease in either group. The ESLD patients had a higher left ventricle (LV) volume and LV mass index, but a lower systolic and diastolic blood pressure. Compared with the healthy subjects, the Ea, Ea/Aa ratio, and Sa values were lower in the ESLD patients. The diameter of the right ventricle and the right atrium were greater in the ESLD patients. In addition, the Ea velocity, Ea/Aa ratio, and mean Sa were demonstrated

Abbreviation:

ESLD	*End-stage liver disease*
LV	*Left ventricle*
STI	*Speckle-tracing imaging*

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to be lower while the E/Ea ratio was higher in patients with ESLD. The primary goal of the study was to evaluate cardiac function using 2-dimensional STI. The mean LV longitudinal strain was demonstrated to be lower in the patient group compared with the control group. Furthermore, the mean LV radial strain and right ventricle longitudinal strain were also demonstrated to be lower in the patient group. Longitudinal and radial strain of the LV were affected rather than circumferential strain, indicating early myocardial damage in the ESLD patients.

Demirtas Inci et al. have applied a novel approach to evaluating cardiac functions in patients with ESLD. Nonetheless, I would encourage the investigators and readers to take into consideration some points related to the study.

One of the aims of the study was to define the utility of the STI technique in the early diagnosis of subclinical cardiac dysfunction while in the process of evaluating ESLD patients before transplantation; however, there is no interobserver analysis. Observer variability is one of the mainstays of studies evaluating a new measurement method, particularly in cardiovascular imaging.[8] In addition, as stated in the limitations section of the article, the number of controls was not sufficient. If the size of the control group had been 3 or 4-fold the number of the patient group, more consistent results with previous studies could have been achieved.[9,10] Another point in the assessment of ESLD is the etiology leading to ESLD. Classifying the patients according to the underlying etiology and performing the analysis including etiological factors would have made the study more comprehensive in terms of determining the causality between cirrhosis and cardiac dysfunction. Factors such as alcohol consumption may be the reason for both liver and cardiac dysfunction and act as a confounder. Another possible confounder is the LV mass index, which was statistically different between the patient and healthy groups. LV mass index may be a direct reason for strain differences between the 2 groups irrespective of underlying liver disease. Therefore, adjustment for confounders would have strengthened the power of the analysis.

Although there are some limitations, this study provides new perspective to clinicians in terms of evaluating patients with ESLD with respect to their cardiac function. Furthermore, it may expand knowledge of the physiopathology of underlying mechanisms in cardiac dysfunction and encourage clinicians to benefit from STI more often in their clinical practice. Following these patients after the transplantation procedure would provide further data to help understand the cardiovascular and hemodynamic changes in ESLD patients.

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