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## Natriuretic peptide and cardiac troponin levels in doxorubicin-induced cardiotoxicity

To the Editor,

We read with a great interest the paper by Argun et al. (1) entitled "Cardioprotective effect of metformin against doxorubicin cardiotoxicity in rats" published in the *Anatolian Journal of Cardiology* 2015 as Epub ahead of print. The authors aimed to investigate the effectivity of metformin in doxorubicin-induced cardiotoxicity using cardiac markers in blood and histopathological examination in the rat model. They concluded that metformin improved the left ventricular function, histopathologic change, and cardiomyocyte apoptosis. We congratulate the authors for this valuable investigation, and we have a few comments.

Doxorubicin (DXR) is a very effective and commonly used chemotherapeutic drug for the treatment of different types of cancers. It blocks cell division and growth by interacting DNA and RNA formation. However, it can cause a life-threatening heart damage, resulting in left ventricular dysfunction, thus limiting its usage (2).

Both atrial natriuretic peptide (ANP) and brain natriuretic peptide (BNP) are useful predictors of decreased left ventricular function in patients treated with DXR. ANP secretion from atria is triggered by atrial dilatation due to cardiac or noncardiac reasons. BNP is produced in the ventricle and is more specific for heart failure than ANP (1-3). Koh et al. (3) reported that plasma BNP levels significantly increased from 6 to 12 weeks in the doxorubicin-induced cardiotoxicity. In the study by Argun et al. (1), there was no statistical difference among groups in terms of ANP or BNP. This may be due to the design of the study, which is relatively short for the occurrence of chronic heart failure because of DXR.

Cardiac troponin (TnT) is a very specific and highly sensitive marker for myocardial damage and commonly used in clinical practice. Similar to BNP, TnT has been reported as an independent predictor of cardiac mortality in heart failure (2-4). In the study by Argun et al. (1), it would have been very helpful to measure TnT levels in terms of myocardial injury due to DXR. Thus, one could make an interpretation that TnT levels had in-

creased in the early stage in the DXR-induced cardiotoxicity, but no change were observed in the BNP levels, which is very crucial for the early detection of DXR-induced cardiotoxicity before irreversible damage.

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## Author's Reply

To the Editor,

Many thanks to the authors for their important comments to our paper entitled "Cardioprotective effect of metformin against doxorubicin cardiotoxicity in rats" published in the *Anatolian Journal of Cardiology* 2015 as Epub ahead of print (1). It is of great importance to detect cardiotoxicity as early as possible in patients receiving cardiotoxic chemotherapy. This would make it possible to minimize cardiotoxicity-associated mortality and morbidity.

The role of cardiac biomarkers such as cardiac troponins and natriuretic peptides in the prediction of chemotherapy-induced cardiotoxicity has been investigated in animal models and clinical studies. These studies have focused on the early detection of cardiotoxicity and/or the relative sensitivities of the available biomarkers for the prediction of cardiotoxicity.

As you indicated, our study could have achieved more significant results if troponins had also been studied in conjunction with brain natriuretic peptide (BNP). Although some studies have not reported significant chemotherapy-induced elevations in tro-