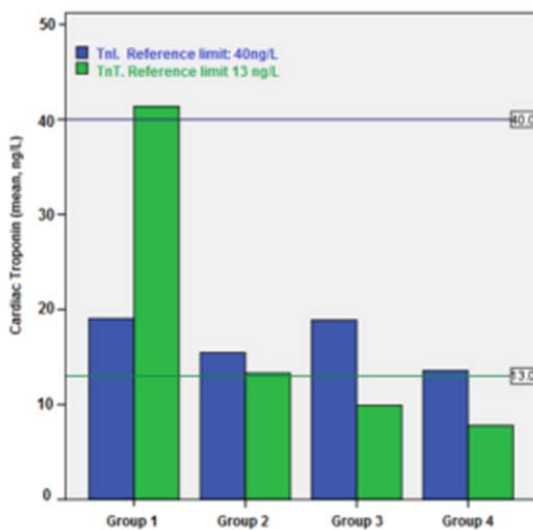


How cardiac troponins should be Interpreted by clinicians?

Troponins are indispensable proteins for muscle contraction. Cardiac troponins are found in heart cells, and they are released into plasma in case of heart injury; so, they are related to various heart disorders with their functional characteristics and to their usefulness as a diagnostic marker especially for acute heart diseases such as myocardial infarction or heart muscle cell death. The 20% or more change in troponin concentration within 3 to 6 hours for a patient with chest pain or acute coronary syndrome, highly indicates acute myocardial infarction (MI), i.e., heart attack. There are two subtypes of troponins that are related to cardiac injury, troponin T and troponin I. In some people, especially for patients with kidney disease, these troponin levels may be higher than the normal population. So, the diagnosis of acute coronary syndrome may be challenging because of high troponin concentrations in patients with chronic kidney disease. Estimated glomerular filtration rate (eGFR) is a measure of renal function and it describes the flow rate of filtered fluid through the kidney. The decreased eGFR value corresponds to a decreased kidney function, especially below 60 mL/min/1.73 m².



The comparison of the mean values of troponin T and troponin I, shown with their reference values. The green line indicates the reference value of troponin T (13 ng/L) and the blue line indicates the reference value of troponin I (40 ng/L).

In this study, we aimed to investigate the difference between high sensitivity troponin T and troponin I in four groups of patients separated according to their eGFR values and the effect of renal function both on troponin T and troponin I.

We choose 119 outpatients and separate them into 4 groups according to their eGFR values as Group 1: eGFR > 30, Group 2: eGFR between 30 and 60, Group 3: eGFR between 60 and 90 and

Group 4: eGFR < 90 mL/min/1.73 m². Then, we measured their cardiac troponin T and I concentrations.

Troponin T values of all patients who have eGFR values lower than 30 mL/min/1.73 m² were above the decision point (13 ng/L), but cTnI values of only 2 patients were above the decision limit (40 ng/L) in this group. The histogram of cardiac troponins is shown in the figure. Also, there was a strong and a significant negative relationship between eGFR and hs-cTnT, but not a significant relationship between eGFR and hs-cTnI when eGFR was taken into consideration as a continuous variable.

In conclusion, it is important to know the different properties of tests used for diagnostic purposes. In this study, we found that cTnT increases with decreasing eGFR values, but cTnI is not affected by the change in eGFR values. So in emergency departments, it is important to know that persistently increased troponin T values in patients with chronic kidney disease in order to separate the true MI from that stable increased value. Besides, the main criteria for the diagnosis of MI is change in troponin levels and this information also can help the physician to retain unnecessary testing and bed occupancy in emergency service.

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