

## Increased C-reactive protein concentrations in patients admitted to the emergency department with troponin level elevations decreases the probability of myocardial ischemia

Meisel SR.; Kobo OM.; Kleisener Shochat M.; Saada M.; Amsalem N.; Levi Y.; Mohsen J.; Zidan A.; Rozen G.; Roguin A.

Hillel Yaffe Medical Center, Hadera, Israel

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**Background** Patients frequently present to the emergency department (ED) with chest pain, dyspnea, or other symptoms with elevated troponin level. This finding prompts a provisional diagnosis of myocardial ischemia and raises the need to exclude this possibility. However, elevated blood troponin may be the result of a systemic inflammatory or infectious state merely representing cardiac injury and not myocardial ischemia.

**Purpose** We hypothesized that the ratio of CRP/troponin could reflect the extent of the systemic inflammatory state that induces an attendant cardiac injury, which if sufficiently high could exclude myocardial ischemia.

**Methods** Study population included 10774 patients admitted to the ED during the years 2016-2019 with cTn level higher > 14 ng/liter. CRP level was measured in all patients and CRP/troponin ratio was assessed against discharge diagnosis of myocardial ischemia, in order to evaluate its ability to exclude ischemic etiology of symptoms. The incidence of myocardial ischemia among study patients decreased with increasing CRP/troponin value.

**Results** The prevalence of myocardial ischemia was 760/2694 patients (28.2%), 415/2694 (15.4%), 294/2695 (10.9%) and 130/2694 (4.8%) with 1st-4th CRP/troponin quartile, respectively ( $p < 0.0001$ ). Logistic regression has shown that the probability of myocardial ischemia decreased by 53%, 68%, and 87% in the second to fourth CRP/troponin quartile compared with the first quartile, respectively ( $p < 0.0001$ ).

**Conclusion** The present study has shown that increased CRP level seems to modulate the specificity of simultaneous troponin as a marker of ischemia. As CRP level increases, so increases the likelihood that concomitant elevated troponin is due to myocardial injury and not due to myocardial ischemia. The clinical implication is that in the presence of a high CRP/troponin ratio, admission to the cardiology department and coronary investigation are unnecessary, whereas appropriate investigation of the actual medical problem is warranted.