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Correlation of Plasma Copeptin Levels and Early Diagnosis of Acute Myocardial Infarction Compared with Troponin-T

Sumitra Piyanutpull

Abstract

Background: Patients present with chest pain. Electrocardiography (ECG) is used and troponin-T levels slowly increases. Diagnosis of myocardial infarction requires prolonged monitoring, over six to nine hours, for serial blood sampling. It is the cause of delayed treatment and lead to a crowded emergency room. Troponin is a marker of myocardial necrosis, the gold standard in detection of acute myocardial infarction (AMI). Copeptin, the C-terminal part of the vasopressin prohormone, as a marker of acute endogenous stress, adds diagnosis information to cardiac troponin in early evaluation of patients with suspected myocardial infarction.

Objective: To determine the correlation between plasma copeptin level and troponin-T. It is also to determine if the copeptin level can be used as early diagnosis in patients who present with chest pain and are suspected to be acute myocardial infarction (AMI).

Material and Method: Patients with chest pain that presented to the emergency department of Rajavithi Hospital between October 2010 and October 2011 and were suspected to have myocardial infarction were consecutively enrolled in the present study. The level of plasma copeptin and troponin-T were measured at presentation and six hours after presentation.

Results: One hundred fifty patients presented to the emergency department with chest pain. Their average age was 66.71 ± 7.78 years. The mean plasma copeptin level was 13.91 ± 5.01 pmol/l in acute myocardial infarction. Plasma copeptin level increased compared with troponin-T. Plasma copeptin level increased and correlated with troponin-T to diagnose myocardial infarction ($r = 0.317$) at presentation. It further increased and correlated ($r = 0.562$) at six hours after presentation. Plasma copeptin levels for diagnosis of ST elevate myocardial infarction (STEMI) at presentation have an area under curve (AUC) = 0.91, $p < 0.001$, sensitivity 90.9%, and specificity 87.8%. The non-ST elevated myocardial infarction (NSTEMI) have an area under curve (AUC) = 0.71, $p < 0.001$, sensitivity 88.8%, specificity 69.8%, and cut-off point of 10.25 pmol/l.

Conclusion: Plasma copeptin can be used for early diagnosis of myocardial infarction. The additional use of copeptin to Troponin-T allows for a rapid triage of chest pain patients to an early diagnosis of non-ST elevation myocardial infarction.

Keywords: Copeptin, Troponin-T, Myocardial infarction

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The Medical Association of Thailand

Address: 4th Floor, Royal Golden Jubilee Building, 2 Soi Soonvijai, New Petchburi Road, Bangkok 10310, Thailand

Telephone: 0-2716-6102, 0-2716-6962 press 0 Fax: 0-2314-6305

E-mail: jmedassocthai@yahoo.com, math@loxinfo.co.th 