Inter-relation between hypoxic liver injury and Killip classification in ST segment elevation myocardial infarction patients

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Purpose: Hypoxic liver injury (HLI) and Killip classification are poor prognosticators of ST segment elevation myocardial infarction (STEMI) patients. We investigated the inter-relationship between hypoxic liver injury (HLI) and Killip classification.

Materials and Methods: 4 tertiary hospitals from Incheon-Bucheon province enrolled 1537 STEMI patients who had undergone percutaneous coronary intervention (PCI) from 2007 to 2014. They were divided into 4 groups according to their Killip classification presented at the emergency room (ER). HLI was defined as ≥2-fold increase of serum aspartate transaminase (AST).

Results: Incidence of HLI showed incremental tendency with respect to Killip classification (19.5%, 19.4%, 34.6%, 37.8%, p<0.001) respectively. Left ventricular ejection fraction (LVEF) was below 45% in symptomatic, overt heart failure patients (Killip class II, III and IV). Initial and peak AST level increased in accordance to Killip classification along with cardiac biomarkers. In-hospital mortality and Killip classification were in direct relation (2.3%, 7.3%, 16.3%, 29.2%) with statistical significance. Univariate and multivariate Cox regression analysis showed that both presence of HLI and combined Killip classification III and IV were poor prognosticators even after adjusting for conventional clinical risk factors. Receiver operating characteristics (ROC) analysis showed that combination of HLI and Killip classification was the most sensitive predictor of mortality (AUC 0.832, 95% CI 0.78-0.882). Kaplan-Meier curve showed that patients with HLI were at higher risk of death in both Killip class (I+II) and Killip class(III+IV) group.

Conclusions: Presence of HLI and Killip classification were in direct-relation translating to worst prognosis. Early recognition of HLI and thorough detection of accurate Killip classification is warranted whilst treating STEMI patients.
HLI, Killip classification and combination of both for predicting in-hospital mortality.
(AUC 0.706, 95% CI 0.640-0.771 Black line: AST)
(AUC 0.77, 95% CI 0.719-0.827 Red line: Killip class)
(AUC 0.832, 95% CI 0.78-0.882, Green line: AST and Killip class combined)
Association of presence of HLI and in-hospital mortality with respect to Killip classification.
A: Killip class I. B: Killip class II. C: Killip class III. D: Killip class IV