Prognostic value of pulmonary-systemic pressure ratio and fibrosis-4 index in patients admitted for acute decompensated heart failure

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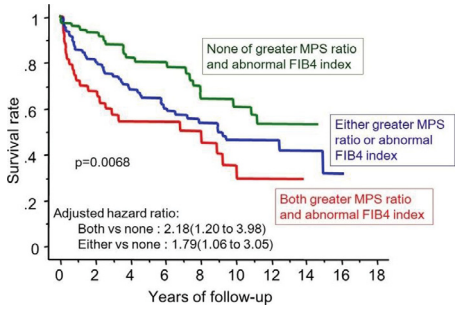
Background: Concomitant presence of pulmonary hypertension in heart failure (HF) is associated with increased adverse events and may be related to interventricular uncoupling and impaired cardiac efficiency. An increased mean pulmonary artery pressure to mean systemic arterial pressure ratio (MPS ratio), a marker of interventricular coupling and efficiency, is reported to be associated with worse clinical outcomes in patients with advanced HF. On the other hand, cardiohepatic interactions have been a focus of attention in HF, and liver dysfunction in HF patients is caused by liver congestion, which is related to liver stiffness. It has been recently shown that liver stiffness assessed by non-invasive fibrosis marker such as Fibrosis-4 (FIB4) index predicts the mortality in HF patients. However, there is no information available on the prognostic value of the combination of MPS ratio and FIB4 index in patients with acute decompensated heart failure (ADHF).

Methods and results: We studied 238 patients admitted for ADHF, who underwent right heart catheterization at the admission and were discharged with survival. MPS ratio was obtained at the admission. FIB4 index was calculated by the formula: age (yrs) $\times$ AST [U/L] / (platelets [$10^3/\mu$L] $\times \sqrt{}$(ALT[U/L])). FIB4 index $>$2.67 was defined as abnormal, as previously reported. During a follow up period of 5.2±4.4 yrs, 93 patients died. At multivariate Cox analysis, MPS ratio (p=0.01) and FIB4 index (p=0.01) were significantly associated with the total mortality, independently of creatinine level and prior heart failure hospitalization, after the adjustment with hemoglobin, albumin levels and body mass index. The patients with both MPS ratio $\geq$0.388 (determined by ROC analysis; AUC 0.613 [0.541–0.687]) and abnormal FIB4 index had a significantly increased risk of the total mortality than those with either greater MPS or abnormal FIB4 index and none of them (52% vs 40% vs 28%, p=0.0068, respectively).

Conclusion: The combination of MPS ratio and FIB4 index might be useful for stratifying ADHF patients at higher risk for the total mortality.



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