Validation of the impact of post discharge change in hemoglobin on the prognosis of HFpEF patients after acute decompensated heart failure from PURSUIT-HFpEF registry

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On behalf of Osaka Cardiovascular Conference

Funding Acknowledgements: None.

Background: Anemia has been reported as poor prognostic factor on heart failure with preserved ejection fraction (HFpEF) in past reports. However, it is not clear at which level hemoglobin (Hb) should be managed to prevent worsening the prognosis of HFpEF.

Aim: The aim of this study is to evaluate the impact of the change in Hb from discharge of congestive heart failure to one year after discharge on the prognosis of HFpEF and verify at which level hemoglobin (Hb) should be managed to prevent worsening the prognosis of HFpEF.

Method: First, 809 HFpEF cases enrolled from June 2016 to June 2021 in PURSUIT-HFpEF registry were divided into three groups according to Hb at discharge, group with Hb < 11 g/dl (n = 327), group with 11 g/dl ≤ Hb < 13 g/dl (n = 300), and group with Hb ≥ 13 g/dl (n = 182). Secondly, the group with Hb < 11 g/dl (n = 327) was divided into two groups according to Hb one year later, group with Hb < 11 g/dl (G1, n = 179) and group with Hb ≥ 11 g/dl (G2, n = 148). Thirdly, the group with 11 g/dl ≤ Hb < 13 g/dl (n = 300) at discharge was divided into three groups according to Hb one year later, group with Hb < 11 g/dl (G3, n = 94), group with 11 g/dl ≤ Hb < 13 g/dl (G4, n = 129), and group with Hb ≥ 13 g/dl (G5, n = 77). Fourthly, the group with Hb ≥ 13 g/dl (n = 182) at discharge was divided into two groups, group with Hb < 13 g/dl (G6, n = 65) and group with Hb ≥ 13 g/dl (G7, n = 117). Major Adverse Cardiovascular Events (MACE) were defined as composite of all-cause death and heart failure readmission. We examined adjusted Hazard ratio (aHR) and incidence rate for MACE between each two groups by Cox regression model and log-rank test.

Result: MACE and all-cause death were significantly lower in G2 than in G1 (MACE; aHR : 0.71, 95%Confidence Interval (CI) : 0.48 - 1.04, log-rank p = 0.012), all-cause death; aHR : 0.47, 95%CI : 0.27 - 0.82, log-rank p = 0.010). MACE, all-cause death and heart failure readmission were significantly higher in G3 than in G4 (MACE; aHR : 1.69, 95%CI : 1.11 - 2.57, log-rank p = 0.005, all-cause death; aHR : 2.71, 95%CI : 1.37 - 5.40, log-rank p = 0.026, heart failure readmission; aHR : 1.59, 95%CI : 1.01 - 2.52, log-rank p = 0.006). All-cause death was significantly lower in G5 than in G4 (aHR : 0.20, 95%CI : 0.05 - 0.84, log-rank p = 0.045). All-cause death was significantly higher in G6 than in G7 (aHR : 10.2, 95%CI : 1.13 - 92.5, log-rank p < 0.001). In multivariate Cox regression model, worsening anemia to Hb < 11 g/dl one year later in patients with 11 g/dl ≤ Hb < 13 g/dl at discharge was independent predictor for MACE (HR : 2.02, 95%CI : 1.17 – 3.49, log-rank p = 0.011).

Conclusion: The impact of post discharge change in hemoglobin seemed to be associated more strongly with all-cause death than heart failure readmission. Hemoglobin levels of at least 11 g/dl might be maintained to prevent the prognosis of HFpEF patients worse after discharge of acute decompensated heart failure.
Study flowchart and Forrest plot
Kaplan-Meier curves and log-rank test