Effect of mean serum potassium level on in-hospital and long-term outcomes in ST segment elevation myocardial infarction

To the Editor,

Serum potassium level plays a substantial role in cardiovascular disorders. Based on previous studies, current guidelines for serum potassium in cardiovascular disorders recommend maintaining the serum potassium level of 4–4.5 mEq/L in patients with AMI (1, 2). Recent studies have examined the recommendations of the guidelines, and the lowest mortality was observed with serum potassium level of 3.5–4 mEq/L in patients with AMI (3, 4). Because of important improvements in revascularization and drug therapies, it is important to re-evaluate the impact of serum potassium level with respect to mortality and ventricular arrhythmias in patients with AMI. To address this critical diversity, further investigations are needed for confirmation. We report a study evaluating the impact of mean serum potassium level on in-hospital and long-term outcomes in a large patient population with STEMI (5). In total, 3,760 consecutive patients diagnosed with STEMI were retrospectively analyzed. At least two serum potassium measurements were taken from each patient, and the mean serum potassium levels were categorized accordingly: <3.0, 3.0–<3.5, 3.5–<4.0, 4.0–<4.5, 4.5–<5.0, 5.0–<5.5, and ≥5.5 mEq/L. Hierarchical logistic regression and Cox-proportional regression analysis were used to establish the relationship between mean serum potassium levels and clinical outcomes. The lowest in-hospital and long-term mortality was determined in patients with serum potassium level of 4–<4.5 mEq/L, whereas mortality was higher in patients with serum potassium levels of ≥5.0 and <3.5 mEq/L. There was a U-shaped association between mean serum potassium level and mortality. In multivariable hierarchical logistic regression analysis, in-hospital mortality risks were higher for patients with serum potassium level of ≥5 mEq/L [odds ratio (OR), 2.60; 95% confidence interval (CI), 1.30–4.2 and OR, 3.22; 95% CI, 1.14–9.07 for patients with serum potassium levels of 5–<5.5 mEq/L and ≥5.5 mEq/L, respectively]. In a multivariable Cox-proportional regression analysis, the mortality risk was higher for patients with serum potassium levels of ≥5 mEq/L [hazard ratio (HR), 2.11; 95% CI, 1.23–4.74 and HR, 4.20; 95% CI, 1.08–8.23, for patients with potassium levels of 5–<5.5 mEq/L and ≥5.5 mEq/L, respectively]. In-hospital and long-term mortality risks were also higher for patients with serum potassium levels of ≤3.5 mEq/L. Conversely, ventricular arrhythmias were higher only for patients with serum potassium levels of ≤ 3.5 mEq/L. Therefore, serum potassium level plays a substantial role in patients with AMI in terms of mortality and ventricular arrhythmias; however, there is no current consensus on optimal serum potassium level in patients with AMI. The current study challenges the current guidelines in clinical practice, which recommend maintaining serum potassium level at 4.0–5.0 mEq/L in patients with AMI. In addition, our findings were in line with recent studies with respect to maintaining serum potassium level at 3.5–4.5 mEq/L. Although the lowest mortality and ventricular arrhythmia range in the current study was 4.0–4.5 mEq/L, it was 3.5–4.0 mEq/L in the recent studies.

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Author`s Reply

To the Editor,

First, we would like to thank the author(s) for their interest and valuable contribution to our research. Both studies were designed in a similar manner (1, 2). The studied populations were both ST-elevation myocardial infarction patients who had undergone primary percutaneous coronary intervention (1, 2). Both