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Address for Correspondence: Dr. Fahrettin Uysal
Uludağ Üniversitesi Tıp Fakültesi, Görükle Kampüsü,
16059 Nilüfer, Bursa-*Türkiye*
Phone: +90 224 295 04 49 Fax: +90 224 442 81 43
E-mail: fahrettin_uysal@mynet.com

Admission serum potassium level is associated with in-hospital and long-term mortality in ST-elevation myocardial infarction

To the Editor,

I have read the article entitled "Admission serum potassium level is associated with in-hospital and long-term mortality in ST-elevation myocardial infarction" by Uluganyan et al. (1) with great interest, recently published in the Anatolian Journal of Cardiology 2015; 16: 10-15. The investigators reported that admission serum potassium (sK) level of >4.5 mmol/L was associated with increased long-term mortality, and significant relation was detected between sK levels of <3 mmol/L and ≥5 mmol/L and ventricular arrhythmias. A previous study demonstrated that mean sK level above 4.5 mmol/L is associated with increased mortality, and sK levels between 3.5 and 4.5 mmol/L is the optimal range suggested for acute MI patients (2). Rate of ventricular fibrillation or cardiac arrest was relatively stable across a wide range of mean post-admission potassium levels, except for extreme values (<3.0 and ≥5.0 mEq/L) (2). Another study revealed that long-term mortality was lowest in patients with potassium levels of 3.5 to <4.0 mEq/L, whereas mortality was higher in patients with potassium levels of ≥4.5 or <3.5 mEq/L (3).

However, because of some confounding factors, I would like to emphasize on some important points to clarify the findings of Uluganyan et al. (1). First, sK level is a very changeable parameter, and many factors affect the sK levels such as drugs, kidney function, and insulin therapy (4,5). Because insulin therapy affects sK level, lack of in-hospital sK follow-up period is a big gap, particularly for patients on insulin therapy. In addition, it is not mentioned whether patients were on standard insulin therapy or patients on insulin infusion were excluded. Second, there was no data regarding the severity and extensiveness of coronary artery disease and PCI procedure and the success rate of total revascularization. Third, they have mentioned ventricular arrhythmias but did not mention the type such as postperfusion ventricular arrhythmias ; postperfusion ventricular arrhythmias are known to be benign, and there is no need for treatment. Fourth, the kind of diuretic treatment that was administrated is not clear. They should have classified diuretic treatments such as the use of loop diuretics, thiazides, and potassium-sparing diuretics.

In conclusion, although the relation between cardiovascular events and sK levels was shown in several studies, further randomized clinical trials are needed with close follow-up of sK levels because many factors may easily affect sK levels.

Levent Cerit
Department of Cardiology, Near East University, Nicosia-*Cyprus*

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Address for Correspondence: Dr. Levent Cerit
Near East University Faculty of Medicine,
Cardiology Department, Nicosia-*Northern Cyprus*
Phone: +90 392 675 10 00
E-mail: drcerit@hotmail.com

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Author`s Reply

To the Editor,

We thank the author(s) for their special comments on our study entitled "Admission serum potassium level is associated with in-hospital and long-term mortality in ST-elevation myocardial infarction" published in the Anatolian Journal of Cardiology 2015; 16: 10-15. In the study, we determined the association between cardiovascular outcomes and admission serum

potassium (sK) levels (1). In our study, we found that there was a significant relation between admission sK levels >4.5 mmol/L and mortality (1). Another notable finding of the study was the significant relation between ventricular arrhythmias and sK levels <3 mmol/L and ≥5 mmol/L (1). These findings of our study support the findings of the previous studies (2, 3).

In the study, we determined the effect of admission sK levels on outcomes rather than the sK levels during the in-hospital period. Therefore, we did not evaluate the impact of insulin therapy on sK levels and outcomes. We mentioned about this condition in the limitations section. The effect of insulin therapy on sK levels and clinical outcomes could be studied in another research.

In addition, being a retrospective study, it has some potential limitations. The coronary artery disease extensiveness and severity was not recorded and studied. Moreover, the aim of the study was the relation between admission sK levels and clinical outcomes. The coronary artery disease extensiveness and severity was not our priority.

Because the time of the ventricular arrhythmias was not recorded, as mentioned in limitations section, we also did not classify ventricular arrhythmias, but rather we evaluated all ventricular arrhythmias together.

Although sK levels are extensively affected by medication, we studied the admission sK levels, and we did not evaluate the effect of medication on sK levels. The effect of medication and diuretics on sK levels could be a part of another study. With regard to previous medication, we did not categorize the diuretics because of the small number of patients using diuretics; however, there was no significant difference between the groups (p=0.27).

The authors stated that the relation between the follow-up sK levels and cardiovascular events should be studied in further randomized clinical trials. In the study we conducted, we investigated the relationship between admission sK levels and cardiovascular outcomes rather than the in-hospital sK levels and difference.

Mahmut Uluganyan
Department of Cardiology, Yedikule Hospital for Chest Disease and Thoracic Surgery, İstanbul-*Turkey*

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Address for Correspondence: Dr. Mahmut Uluganyan
Yedikule Göğüs Hastalıkları ve Göğüs Cerrahisi Eğitim ve Araştırma Hastanesi Kardiyoloji Bölümü
PB: 34000, İstanbul-*Türkiye*
E-mail: uluganyan@yahoo.com

ATP-binding cassette, sub-family B (MDR/TAP), member 1 (ABCB1) polymorphism and clopidogrel concentration in acute coronary syndrome: molecular change can explain the observed therapeutic concentration

To the Editor,

Clopidogrel is the current widely used drug in acute coronary syndrome (1). The therapeutic level of clopidogrel is important for successful management of patients (2). Genetic underlying factor is mentioned as an important determinant for finalizing clopidogrel level. ATP-binding cassette, sub-family B (MDR/TAP), member 1 (ABCB1) polymorphism is mentioned for the interrelationship with clopidogrel concentration. Stokanovic et al. (3) studied ABCB1 C3435T polymorphism and found that "patients carrying at least one C allele achieved significantly higher serum concentration of clopidogrel." In fact, the main action of any polymorphic form of ABCB1 is binding, which requires energy reaction. This concept is successfully used for explanation on the observed phenomenon in drug susceptibility and resistance (4). Based on the quantum energy calculation, the assessment of required energy can be useful for explanation of the observed final clopidogrel blood concentration. Focusing on each polymorphism at position 3435, the molecular weights of CC, CT, and TT genotypes are equal to 222.204, 237.215, and 252.227, respectively. Based on this information, the required energy for CC genotype will be the least, which further implies the best final clopidogrel level. This is concordant with the report by Stokanovic et al. (3).

Beuy Joob, Viroj Wiwanitkit[1]
Sanitation 1 Medical Academic Center, Bangkok-*Thailand*
[1]Visiting Professor, Hainan Medical University, Hainan-*China*

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