Anatol J Cardiol 2016; 16: 298-304 Letters to the Editor 303

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  $\geq$ 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* 

#### References

- Uluganyan M, Ekmekçi A, Murat A, Avşar Ş, Ulutaş TK, Uyarel H, et al. Admission serum potassium level is associated with in-hospital and long-term mortality in ST-elevation myocardial infarction. Anatolian J Cardiol 2016; 16: 10-5.
- 2. Goyal A, Spertus JA, Gosch K, Venkitachalam L, Jones PG, Van den Berghe G, et al. Serum potassium levels and mortality in acute myocardial infarction. JAMA 2012; 307: 157-64. [CrossRef]
- Choi JS, Kim YA, Kim HY, Oak CY, Kang YU, Kim CS, et al. Relation of serum potassium level to long-term outcomes in patients with acute myocardial infarction. Am J Cardiol 2014; 113: 1285-90. [CrossRef]

**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<sup>1</sup> Sanitation 1 Medical Academic Center, Bangkok-*Thailand*<sup>1</sup>Visiting Professor, Hainan Medical University, Hainan-*China*

#### References

- Grove EL, Würtz M, Thomas MR, Kristensen SD. Antiplatelet therapy in acute coronary syndromes. Expert Opin Pharmacother 2015; 16: 2133-47. [CrossRef]
- 2. Oliphant CS, Trevarrow BJ, Dobesh PP. Clopidogrel response variability: review of the literature and practical considerations. J Pharm Pract 2015; 29: 26-34. [CrossRef]
- 3. Stokanovic D, Nikolic VN, Konstantinovic SS, Zvezdanovic JB, Lilic J, Apostolovic SR, et al. P-Glycoprotein Polymorphism C3435T Is

304 Letters to the Editor Anatol J Cardiol 2016; 16: 298-304

Associated with Dose-Adjusted Clopidogrel and 2-Oxo-Clopidogrel Concentration. Pharmacology 2015; 97: 101-6. [CrossRef]

 Wiwanitkit V. Analysis of binding energy activity of imatinib and Abl tyrosine kinase domain based on simple consideration for conformational change: An explanation for variation in imatinib effect in mutated type. Indian J Cancer 2009; 46: 335-6. [CrossRef]

### Address for Correspondence: Beuy Joob, MD,

Sanitation 1 Medical Academic Center, Bangkok-*Thailand* 

E-mail: beuyjoob@hotmail.com

©Copyright 2016 by Turkish Society of Cardiology - Available online at www.anatolicardiol.com

DOI:10.14744/AnatolJCardiol.2016.7027



## Emergency endovascular treatment of peripheral arterial injuries occurring during the Syrian civil war: Gaziantep Dr. Ersin Arslan Education and Research Hospital Experience

To the Editor,

As we are working in Gaziantep Dr. Ersin Arslan Education and Research Hospital that is approximately 50 km away from Turkish-Syrian border, we frequently encounter peripheral arterial injuries in terms of emergency endovascular interventions. Therefore, we would like to share our single-center experience of these patients with you and our colleagues. Extremity injuries involving a major artery that are not promptly diagnosed and treated can lead to death or loss of the extremity. Arterial injury can cause distal ischemia because of hemorrhage, hematoma, laceration, or thrombosis, and the complications of the injury can lead to pseudoaneurysm or arteriovenous fistula (1). Endovascular therapy is a continuously developing alternative to surgical therapy in selected patients. Between July 2012 and May 2014, 21 patients were evaluated by digital subtraction angiography in our catheterization laboratory. Twelve of them were operated and nine patients underwent emergency endovascular interventions in our cath lab. Lesion types were hemorrhagic laceration fistulazing to the skin, arteriovenous fistula, pseudoaneurysm, and distal ischemia due to postoperative occlusion. Patients had internal carotid artery, axillary artery, brachial artery, superficial femoral artery, and popliteal artery injuries. The conventional treatment for perforation, aneurysm, pseudoaneurysm, and arteriovenous fistula caused by penetrating arterial trauma is surgery; however, the deteriorated anatomy and hematoma around

the lesion as well as the risks of performing the surgery again can make surgical option a challenging procedure (2). Endovascular interventions also have their own risks and complications such as stent occlusion, stent fracture, restenosis, and loss of collaterals during stent placement (3). The most often traumatized vessel is the femoropopliteal artery, the same as in our series. Direct penetrating injuries caused by deep stabs, gunshots, or high-kinetic energy weapons can cause pseudoaneurysm or arteriovenous fistulas. The graft stent implantation in femoral interventions provides a patency rate of 88% in one year. Less thrombogenic heparin-bonded stents are being implanted for arteries running through joints. These stents are resistant to fracture and have high radial strength (4). As this is a case series of nine patients treated with covered stents in one center, we could say surgery should be the first-line treatment for these kinds of lesions (5). However, because of reoperation and anatomical challenges, reluctance of the vascular surgical team to redo the procedure, and patient preferences, endovascular treatment of these kinds of lesions could be another option.

Ertan Vuruşkan, Erhan Saraçoğlu, Mehmet Küçükosmanoğlu, Fethi Yavuz, Zülfiye Kuzu, İsa Sincer Clinic of Cardiology, Gaziantep Dr. Ersin Arslan Education and Research Hospital, Gaziantep-*Turkey* 

#### References

- Katsanos K, Sabharwal T, Carrell T, Dourado R, Adam A. Peripheral endografts for the treatment of traumatic arterial injuries. Emerg Radiol 2009: 16: 175-84. [CrossRef]
- Franco CD, Goldsmith J, Veith FJ, Calligaro KD, Gupta SK, Wengerter KR. Management of arterial injuries produced by percutaneous femoral procedures. Surgery 1993; 113: 419-25.
- Onal B, Ilgit ET, Koşar S, Akkan K, Gümüş T, Akpek S. Endovascular treatment of peripheral vascular lesions with stent-grafts. Diagn Interv Radiol 2005; 11: 170-4.
- Lammer J, Zeller T, Hausegger KA, Schaefer PJ, Gschwendtner M, Mueller-Huelsbeck S, et al. Heparin-bonded covered stents versus bare-metal stents for complex femoropopliteal artery lesions: the randomized VIASTAR trial (Viabahn endoprosthesis with PROPATEN bioactive surface [VIA] versus bare nitinol stent in the treatment of long lesions in superficial femoral artery occlusive disease). J Am Coll Cardiol 2013; 62: 1320-7. [CrossRef]
- Ruppert V, Sadeghi-Azandaryani M, Mutschler W, Steckmeier B. Vascular injuries in extremities. Chirurg 2004; 75: 1229-40. [CrossRef]

Address for Correspondence: Dr. Ertan Vuruşkan Gaziantep Eğitim ve Araştırma Hastanesi Kardiyoloji Bölümü, 2700 Gaziantep-*Türkiye* Phone: +90 505 271 09 00

E-mail: ertanvuruskan@hotmail.com ©Copyright 2016 by Turkish Society of Cardiology - Available online at www.anatoljcardiol.com

DOI:10.14744/AnatolJCardiol.2016.6964

