

# New Horizons in Coronary Artery Disease

## OP-107 [AJC » Preventive cardiology]

**Antithrombotic Drug Resistance In Patients With Coronary Artery Disease.** *Gizem Türkel, Ali Rıza Bilge, Fatma Taneli, Hakan Tıkız, Department of Cardiology, Celal Bayar University, Manisa, Turkey.*

**Objectives:** In this prospective study, we aimed to detect the frequencies of the drug resistance in patients with coronary artery disease (CAD) using acetylsalicylic acid (ASA), clopidogrel, prasugrel, and ticagrelor. We also aimed to investigate the relationship between frequency of resistance development and the cardiovascular risk factors, gender and drug regimens.

**Methods:** A total of 165 patients (>18 years) diagnosed with CAD and who were on antiplatelet drugs regimens such as ASA, clopidogrel, prasugrel and ticagrelor) for at least for 6 months were included in the study. All of the patients were on ASA treatment in combination with other antithrombotic drugs or alone. 53 patients were receiving only ASA treatment. 53 patients received ASA+clopidogrel treatment, 12 patients received ASA+prasugrel treatment, and 47 patients received ASA+ticagrelor treatment. The thrombocyte aggregation of the patients was performed using a using the Multiplate electrode aggregometry (MEA). For the patients using ASA, values above 71 AUC [U] were regarded as resistant to ASA. For the patients receiving P2Y12 inhibitor drug treatment, while those values above 57 AUC [U] were regarded as resistant to these drugs.

**Results:** A total of 114 male (%69.1) and 51 female (%30.9) patients (mean age 60.7 ± 1.1 years) constituted the study population. Results: ASA resistance in combined therapy or alone was found in 30 of 165 patients (18.2%). Of the 53 patients receiving only ASA treatment, 10 of them (18.9%) were resistant to ASA treatment. Of the 53 patients receiving ASA+clopidogrel combined treatment, 22 of them (41.5%) were found to be resistant to clopidogrel treatment. Of the 12 patients receiving ASA+prasugrel combined treatment, 2 of them (16.7%) were resistant to prasugrel treatment. Of the 47 patients receiving ASA+ticagrelor combined treatment, 4 of them (8.5%) were resistant to ticagrelor treatment. No statistically significant difference was found between the risk factors such as age, sex, hypertension, diabetes mellitus, smoking and the drug resistance (p>0,05). There was also no significant difference for the drug usage such as ACE-i/ARB and CCB and the drug resistance (p>0,05). However, only a statistically significant difference was found when the drug response of

ASA+clopidogrel group was examined with the concurrent use of B-blocker (p = 0.010).

**Conclusions:** This study detected that the highest frequency of resistance was at patients used clopidogrel (%41.5), resistance against prasugrel and ticagrelor is also possible and the lowest frequency of resistance development is at group used ticagrelor (%8.5). Given these high frequencies, performing routine tests for resistance on the patients receiving antiplatelet treatment is crucial for treatment success. However, studies using larger populations are necessary to precisely reveal the frequencies of resistance.

**Keywords:** Multiplate electrode aggregometry, acetylsalicylic acid, clopidogrel, prasugrel, ticagrelor

### Comparison of Resistance Rates of Antithrombotic Treatment

	ASA (all patients)	ASA	Klopidogrel	Prasugrel	Tikagrelor	p
Sensitive	135 (81.8%)	43 (81.1%)	31 (58.5%)	10 (83.3%)	43 (91.5%)	0.001
Resistant	30 (18.2%)	10 (18.9%)	22 (41.5%)	2 (16.7%)	4 (8.5%)	b,d

a: ASA - ASA+Tikagrelor; b: ASA - ASA+Klopidogrel; c: ASA - ASA+Prasugrel; d: ASA+Tikagrelor - ASA+Klopidogrel; e: ASA+Tikagrelor - ASA+Prasugrel; f: ASA+Klopidogrel - ASA+Prasugrel ASA: Asetilsalisilik asit

## OP-108 [AJC » Acute Coronary Syndromes]

### Association Between Admission Glucose and Coronary Collateral Flow In ST-Elevation Myocardial Infarction Patients.

*Özge Kurmuş, Sezen Bağlan Uzunget, Şükri Karaarslan, Aslı Tanındı, Berkay Ekici, Ayçan Fahri Erkan, Ebru Akgül Ercan, Celal Kervancıoğlu, Department of Cardiology, Ufuk University, Ankara, Turkey.*

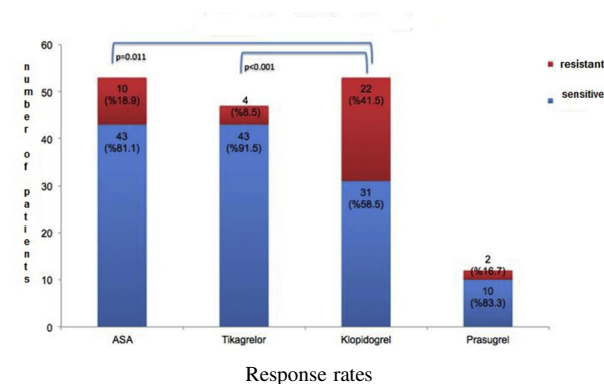
**Objective:** In patients with acute myocardial infarction, glucose metabolism is altered and acute hyperglycemia on admission is common regardless of diabetes status.

Several studies have demonstrated that admission hyperglycemia is independently associated with increased mortality after myocardial infarction regardless of treatment modality. Formation of coronary collateral vessels is an adaptive response secondary to myocardial ischemia in the presence of significant stenosis or total occlusion. It can provide an alternative source of blood supply to a myocardial area jeopardized by ischemia. Data regarding admission glucose and its association with coronary collateral flow in the setting of ST-segment elevation myocardial infarction (STEMI) are limited. In this study, we aimed to investigate whether glucose value on admission is associated with collateral flow in STEMI patients.

**Methods:** We retrospectively evaluated 190 consecutive patients with a diagnosis of first STEMI within 12 hours of onset of chest pain. Coronary collateral development was graded according to Rentrop classification: 0= no filling of any collateral vessel; 1= filling of the side branches of the the artery to be perfused by collateral vessels without visualization of the epicardial segment; 2= partial filling of the distal epicardial segment by collateral vessels; 3= complete filling of the distal epicardial segment by collateral vessels. Rentrop 0-1 was graded as poor collateral development and Rentrop 2-3 was graded as good collateral development.

Admission glucose was measured and compared between two groups.

**Results:** Mean admission glucose level was 173.0±80.1 mg/dl in study population. Forty- five (23.7%) patients had good collateral development and 145 (76.3%) patients had poor collateral development. There were no statistically significant differences in demographic characteristics between two groups (Table1). Three-vessel disease was



more common in patients with good collateral development ( $p=0.02$ ). Mean admission glucose level was higher in patients with poor collateral than good collateral ( $180.6\pm 84.9$  mg/dl vs  $148.7\pm 56.6$  mg/dl respectively,  $p=0.008$ ). In univariate analysis, higher admission glucose was associated with poor collateral development but multivariate logistic regression analysis revealed a borderline result (odds ratio 0.994, 95%CI: 0.989-1.000,  $p=0.049$ ) that higher admission glucose was a predictor of poor collateral circulation.

**Conclusions:** Our results suggest that elevated glucose on admission may have a role in the attenuation of coronary collateral blood flow in acute myocardial infarction. Further studies are needed to validate our results.

**Keywords:** admission glucose, coronary collateral flow, STEMI Clinical and laboratory characteristics among poor collateral and good collateral groups

Variables	All patients n=190	Good collateral n=45	Poor collateral n=145	P
Age (years)	61.64±12.2	60.4±13.3	61.9±11.9	0.473
Men (%)	73.7	68.9	75.2	0.403
Diabetes mellitus (%)	27.4	26.7	27.6	0.904
Hypertension (%)	47.4	40.0	49.7	0.257
Smokers (%)	46.8	42.2	48.3	0.477
Dyslipidemia (%)	53.7	48.9	55.2	0.460
Mean Ejection fraction (%)	42.3±8.6	43.2±8.3	41.4±9.1	0.476
Anterior MI (%)	43.7	33.3	46.9	0.036
Three-vessel disease (%)	23.2	37.8	18.6	0.026
Mean admission glucose (mg/dl)	173.0±80.1	148.7±56.6	180.6±84.9	0.008
Mean Hemoglobin (g/dl)	13.8±1.8	13.6±1.8	13.9±1.8	0.234
Mean white blood cell count	11604.8 ±5091.3	11037.1 ±4439.1	11780.9 ±5279.1	0.440
Mean Platelet count	244.0±64.1	248.22±61.65	242.80±65.01	0.621
Mean total cholesterol level (mg/dl)	192.2±51.1	178.0±42.5	196.6±52.8	0.354
Mean low density lipoprotein level (mg/dl)	125.5±33.6	117.7±27.8	127.9±34.4	0.046
Mean High density lipoprotein level (mg/dl)	40.6±10.0	41.0±10.1	39.3±9.5	0.312
Mean triglyceride level (mg/dl)	134.7±103.9	120.1±99.8	139.2±105.0	0.718
Mean creatinine (mg/dl)	0.97±0.2	0.96±0.2	0.98±0.2	0.692

### OP-109 [AJC » Preventive cardiology]

**Assessment of Indirect Inflammatory Markers in Patients with Myocardial Bridging.** *Levent Cerit. Department of Cardiology, Near East University, Nicosia, Cyprus.*

**Introduction:** Myocardial bridging (MB) is a congenital variant of the coronary artery in which a portion of the epicardial coronary artery takes an intramuscular course. Although it is considered a benign anomaly, it may lead to such complications as myocardial ischaemia, acute coronary syndrome, coronary spasm, exercise-induced dysrhythmias or even sudden death. MB may be related to increased inflammatory and atherosclerotic processes. This study was conducted with the aim of evaluating the relationship between neutrophil/lymphocyte ratio (NLR) and MB.

**Methods:** Taking into consideration the inclusion criteria, 86 patients with MB and 88 with normal coronary angiographies (control group) were included in the study. The association between MB and laboratory and other clinical parameters was evaluated.

**Results:** The platelet distribution width (PDW) ( $17.3 \pm 0.40$  vs  $16.1 \pm 0.5$ ;  $p < 0.05$ ), NLR ( $3.2 \pm 1.3$  vs  $2.2 \pm 0.9$ ;  $p < 0.05$ ) and red cell

distribution width (RDW) ( $14.3 \pm 1.3$  vs  $13.1 \pm 1.1$ ;  $p < 0.05$ ) were significantly higher in the MB group than in the control group.

**Conclusions:** This study demonstrated that compared to normal coronary arteries, PDW, NLR and RDW were significantly higher in MB patients. Further studies are needed to clarify the increased inflammatory parameters in patients with MB.

**Keywords:** Myocardial bridging, neutrophil to lymphocyte ratio, platelet distribution width

### OP-110 [AJC » Chronic stable angina pectoris]

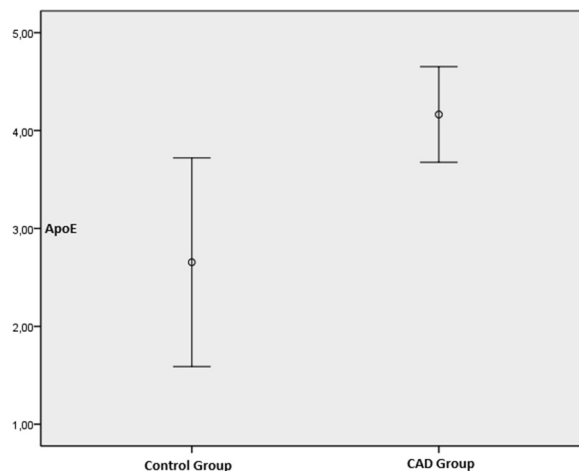
**Serum Apolipoprotein E Levels are Higher in Individuals With Atherosclerotic Coronary Artery Disease When Compared to Those Without: Presentation of Preliminary Findings.**

*Aycan Fahri Erkan<sup>1</sup>, Neslihan Çoban<sup>2</sup>, Berkay Ekici<sup>1</sup>, Özge Kurmuş<sup>1</sup>, Sezen Bağlan Uzunet<sup>1</sup>, Ayşem Kaya<sup>3</sup>, Evin Ademoğlu<sup>4</sup>, Celal Kervancıoğlu<sup>1</sup>.*  
<sup>1</sup>Department of Cardiology, Medical Faculty, Ufuk University, Ankara, Turkey; <sup>2</sup>Department of Genetics, Institute for Experimental Medicine, Istanbul University, Istanbul, Turkey; <sup>3</sup>Division of Biochemistry, Institute of Cardiology, Istanbul University, Istanbul, Turkey; <sup>4</sup>Department of Biochemistry, Medical Faculty, Istanbul University, Istanbul, Turkey.

**Background and Aim:** While certain variations in the Apolipoprotein E (ApoE) gene are strongly linked to higher serum low-density lipoprotein cholesterol levels and consequent atherosclerotic coronary artery disease (CAD), published data on the interaction of serum ApoE levels and CAD are relatively scarce. We aimed to elucidate whether serum ApoE levels are related to angiographic presence and severity of CAD.

**Methods:** We measured serum levels of ApoE in 271 consecutive patients who had undergone invasive coronary angiography due to chest discomfort and myocardial ischemia documented with a non-invasive stress test. Individuals with a normal coronary angiogram constituted the control group (n:42), whereas patients with coronary atherosclerosis constituted the CAD group (n:229). The angiographic severity of CAD was evaluated using the Gensini score. Serum ApoE level was measured utilizing an immunonephelometry assay.

**Results:** Mean serum ApoE level was  $2.65\pm 3.41$ g/L and  $4.16\pm 3.74$ g/L in the control and the CAD groups, respectively. Mean serum ApoE



Serum ApoE Levels According to Groups. Serum ApoE levels are significantly higher in the CAD group when compared to the control group.