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PROGNOSTIC VALUE OF ST SEGMENT CHANGES IN AVR LEAD IN PATIENTS WITH NON-STEMI OR ANTEROLATERAL STEMI

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ABSTRACT

Background: ST segment changes in aVR lead may effectively predict early mortality in patients with acute myocardial infarction (MI). We aimed to assess the value of ST segment changes in aVR lead to predict outcome in patients with anterolateral MI or with non-ST segment elevation MI (STEMI).
Methods: The hospital recorded files of 200 consecutive patients with one of the two diagnoses of anterolateral MI or non-STEMI were retrospectively assessed. Four subgroups were defined as the group with ST elevation > 0.5 mV in aVR lead (n = 53), 2) ST depression > 0.5 mV in aVR lead (n = 34), 3) without ST change in aVR (n = 87), and 4) with any ST change in aVR (n = 26).
Results: In-hospital mortality rate was 30.2% in the group with ST elevation, 23.5% in those with ST depression, 9.2% in those without ST change, and 11.5% in those with any ST change in aVR that was higher two former groups. The prevalence of repeated MI was 17%, 2.9%, 2.3%, and 3.8% respectively indicating higher in-hospital MI in the group suffered ST-segment elevation MI. The rate of revascularization and length of hospital stay did not also differ across the groups. In multivariate regression model, both ST elevation and ST depression in aVR predicted in-hospital death. Main predictor for in-hospital MI included the presence of as ST elevation in aVR lead.
Conclusion: A significant change of ST segment in aVR lead predicts both in-hospital mortality and reccurrence of MI within hospitalization in patients with anterolateral MI or with non-STEMI.

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Introduction

The initial prognosis of acute myocardial infarction is significantly associated with myocardial reservation following appearance of ischemic event, scar zone caused by previous infarcts, and also arterial branches in different zones of myocardium. In patients without history of myocardial infarction or without additional coronary lesions, the prognosis of disease is directly associated with the size of ischemic tissue that supplied by culprit arteries distal to coronary stenosis.(1-3) However, among those patients with a limited myocardial reserve or with diffuse fibrosis, even a minor infarction can be important and decisive. Therefore, in addition to diagnosis of disease, determining the size of infarction and also the rate of myocardial reservation is required. In this line, electrocardiography (ECG) can be very helpful to assessing size of ischemia, differentiation of transmural and subendocardial infarction as well as determining old infarction events. (4) Moreover, some pattern in ECG can manifest the presence of diffuse coronary disease or progression of myocardial ischemia. Regarding pathophysiological mechanisms of

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myocardial infarction, size of infarction and the level of defected myocardium may have heterogeneous pattern. The assessment of the level of risk and also prognostic condition of patients include a major part of management and treatment of disease. (5) In this regard, designing and interpreting ST segment changes on admission is one of powerful factors to predict adverse cardiac events in patients with acute myocardial infarction. (6-8)

Although aVR lead in ECG usually marks involvement of Right upper part of the heart muscle, it may be ignored in interpretation of ECG. (9) ST elevation in aVR with some other repolarization changes indicates occurrence of severe lesions in coronary arteries in patients suffered unstable angina or STEMI. (10-15) Some studies also showed that ST elevation in this lead can effectively predict early mortality in those patients with inferior myocardial infarction with a high sensitivity. (11,16,17,18) However, it remains controversial the prognostic value of ST changes in aVR lead to predict outcome especially in patients with non-STEMI. Hence, the present study aimed to assess the value of ST changes in aVR to predict mortality and morbidity in patients with anterolateral MI or with non-STEMI.

Patients and methods

In a cross-sectional study the hospital recorded files of 200 consecutive patients with one of the two diagnoses of anterolateral MI or with non-STEMI were retrospectively assessed. Initial 12-lead ECG assessment was performed at emergency ward. All changes in ECG leads especially ST segment changes were reviewed by a single cardiologist. In this study, all patients with typical manifestations of MI that undergoing diagnostic examinations including ECG assessment and cardiac enzymes measurement led to the diagnosis of non-STEMI or anterolateral MI within 24 hours of symptoms appearance were included. Those with previous history of MI, history of hospitalization in CCU ward, inferior wall MI, or presence of incorrect records were excluded from the study. All baseline characteristics including demographics, medical history, medication, and history of cardiac interventions were collected by the review of recorded files. The patients were divided into four subgroups according to ST change as 1) ST elevation > 0.5 mV in aVR lead, 2) ST depression > 0.5 mV in aVR lead, 3) without ST change in aVR, and 4) with any ST change in aVR. The main study endpoint in this study as the patients' outcome were in-hospital mortality, repeated MI in hospital, and cerebrovascular accident.

Results were presented as mean ± standard deviation (SD) for quantitative variables and were summarized by frequency (percentage) for categorical variables. Continuous variables were compared using ANOVA test or Non-parametric Kruskal-Wallis H test whenever the data did not appear to have normal distribution or when the assumption of equal variances was violated across the study groups. Categorical variables were, on the other hand, compared using chi-square test. The multivariate regression model was used to determine main predictors of in-hospital outcomes. For the statistical analysis, the statistical software SPSS version 16.0 for windows (SPSS Inc., Chicago, IL) was used. P values of 0.05 or less were considered statistically significant.

Results

In this study, four subgroups were defined as the group with ST elevation > 0.5 mV in aVR lead (n = 53), 2) ST depression > 0.5 mV in aVR lead (n = 34), 3) without ST change in aVR (n = 87), and 4) with any ST change in aVR (n = 26). The groups were comparable in mean age and also sex distribution so the mean age of participants was 65.38 ± 11.38 years, 64.35 ± 12.69 years, 64.08 ± 14.17 years, and 62.04 ± 13.85 years (p = 0.770) with male frequency of 69.8%, 58.8%, 71.3%, and 80.8%, respectively (p = 0.317). Among different coronary risk factors (table 1).

Table 1: Baseline characteristics of study population in different subgroups of ST change

Item	ST segment elevation	ST segment depression	Without ST change	With ST change	p-value
Male gender	37 (69.8)	20 (58.8)	62 (71.3)	21 (80.8)	0.317
Age, year	65.38 ± 11.38	64.35 ± 12.69	64.08 ± 14.17	62.04 ± 13.85	0.770
Current Smoking	12 (22.6)	7 (20.6)	27 (31.0)	7 (26.9)	0.542
Diabetes	34 (64.2)	22 (64.7)	34 (39.1)	11 (42.3)	0.008
Hypertension	26 (49.1)	26 (76.5)	40 (46.0)	11 (42.3)	0.014
Family history of CAD	6 (11.3)	6 (17.6)	14 (16.1)	6 (23.1)	0.593
Dyslipidemia	30 (56.6)	15 (44.1)	50 (57.5)	11 (42.3)	0.355
CVA	8 (15.1)	2 (5.9)	3 (3.4)	2 (7.7)	0.086
DVT	1 (1.9)	1 (2.9)	1 (1.1)	1 (3.8)	0.818

PVD	4 (7.5)	0 (0.0)	2 (2.3)	1 (3.8)	0.242
LVEF, %	33.02 ± 11.28	31.47 ± 12.71	36.90 ± 14.17	36.92 ± 14.36	0.119

the overall prevalence of diabetes mellitus was considerably higher in those with ST elevation or ST depression in aVR lead compared to other subgroups. Also, hypertension was more prevalent in those patients with significant ST depression than in other patients' subgroups. There was also no difference in mean left ventricular ejection fraction across the four subgroups (p = 0.119). Regarding in-hospital mortality (table 2).

Table 2: Outcome in study population in different subgroups of ST change

Item	ST segment elevation	ST segment depression	Without ST change	With ST change	p-value
In-hospital mortality	16 (30.2)	8 (23.5)	8 (9.2)	3 (11.5)	0.009
Myocardial infarction	9 (17.0)	1 (2.9)	2 (2.3)	1 (3.8)	0.004
Cerebrovascular accident	0 (0.0)	0 (0.0)	0 (0.0)	1 (3.8)	0.041
Revascularization	37 (69.8)	30 (88.2)	56 (64.4)	18 (69.2)	0.080
Type					
Fibrinolytic	15 (28.3)	14 (41.2)	28 (32.2)	7 (26.9)	0.807
PCI	11 (20.8)	6 (17.6)	15 (17.2)	6 (23.1)	0.939
Primary PCI	2 (3.8)	3 (8.8)	4 (4.6)	0 (0.0)	0.470
CABG	9 (17.0)	7 (20.6)	9 (10.3)	5 (19.2)	0.551
Length of hospital stay	4.85 ± 4.33	5.88 ± 4.97	5.55 ± 3.71	7.15 ± 9.60	0.318

this rate was 30.2% in the group with ST elevation > 0.5 mV in aVR lead, 23.5% in those with ST depression > 0.5 mV in aVR lead, 3) 9.2% in those without ST change in aVR, and 11.5% in those with any ST change in aVR, that was higher two former groups (p = 0.009). Also, the prevalence of repeated MI was 17%, 2.9%, 2.3%, and 3.8% respectively indicating higher in-hospital MI in the group suffered ST-segment elevation MI (p = 0.004). The rate of in –hospital revascularization in four groups was 86.9%, 88.2%, 64.4%, and 69.2% with no significant difference (p = 0.080). Cerebrovascular accident was revealed only in one patient in the group with any ST change in aVR. The mean length of hospital stay was 4.55 ± 4.33 days in the group with ST elevation > 0.5 mV in aVR lead, 5.88 ± 4.97 days in those with ST depression > 0.5 mV in aVR lead, 5.55 ± 3.71 days in those without ST change in aVR, and 7.15 ± 9.60 days in those with any ST change in aVR with no significant difference (p = 0.318). In multivariate regression model (table 3).

Table 3: Main predictors of in-hospital mortality

Item	Beta	Odds Ratio	p-value
ST change	0.606	1.833	0.016
Male gender	0.046	1.047	0.935
Age	0.105	1.111	< 0.001
LVEF	-0.083	1.086	< 0.001
Diabetes	1.879	6.536	0.002
Hypertension	-0.144	0.866	0.786
Family history of CAD	-0.598	0.550	0.402
Cerebrovascular event	-1.445	0.236	0.092
Deep vein thrombosis	17.642	4.588	0.999
Peripheral vascular disease	-0.476	0.621	0.719
Dyslipidemia	-0.676	1.965	0.164
Current smoking	0.175	1.191	0.621

both ECG changes as ST elevation> 0.5 mV in aVR or ST depression > 0.5 mV in aVR could effectively predict in-hospital death with the Odds Ratio of 1.8. Other predictors for in-hospital death were advanced age, low LVEF, and history of MI.

Also, main predictors for in-hospital MI included the presence of as ST elevation> 0.5 mV in aVR, male gender, and history of peripheral vascular disease (table 4).

Table 4: Main predictors of in-hospital repeated MI

Item	Beta	Odds Ratio	p-value
ST change	0.843	2.324	0.026
Male gender	2.810	16.614	0.021
Age	-0.020	0.980	0.527
LVEF	0.058	1.060	0.058
Diabetes	-0.931	0.394	0.201
Hypertension	-0.541	0.582	0.468
Family history of CAD	0.250	1.284	0.833
Cerebrovascular event	-0.318	0.727	0.755
Deep vein thrombosis	21.372	1.913	0.999
Peripheral vascular disease	-2.778	0.062	0.024
Dyslipidemia	0.021	1.021	0.975
Current smoking	0.053	1.054	0.897

In addition, in another regression model, neither ST change in in aVR lead nor other baseline parameters could predict in-hospital revascularization.

Discussion

Despite the development of improved diagnostic strategies , the ECG remains an essential clinical tool for diagnosis, evaluation ,and management of acute coronary syndrome. in this group of patients early risk stratification is crucial for appropriate management and for deciding whether early invasive strategy should be adopted .Recent evidences emphasize the central role of ST changes in different leads to risk stratification and determine outcome of patients who suffered MI. in this context, our study attempted to determine the role of ST change in aVR lead to predict in-hospital outcome in patients who experienced either non-STEMI or anterolateral MI. In our study, significant ST elevation or ST depression was shown to be predictive for early mortality in these groups of patients. Furthermore, ST segment elevation in aVR lead could predict repeated MI within hospitalization. However, ST changes in this lead could not predict in-hospital revascularization or cerebrovascular accident. On the other hand, ST segment changes in aVR lead could well predict mortality and MI in both groups of patients with STEMI or non-STEMI that was consistent with the previous studies. In Wong et al. (19)study, ST elevation at least 1 mm in aVR lead has been shown to be predictive for 30-day mortality in both anterior and inferior MI. In fact, each 0.5 mm elevation in ST was accompanied with 30% increase in early mortality. In another study by Kukula et al. (20) a change in ST segment in aVR was indicated in 42.2% of patients. Also, in their study, mortality rate in patients with ST-elevation, ST depression, and those without ST change was 27.7%, 16.5%, and 1.0% with a significant difference. Alherbish et al. (21) also showed that the appearance of ST change in aVR lead was accompanied with higher mortality rate so ST change in this lead led to higher 3-month mortality in those with inferior MI. Barrabés et al. (22) also indicated that in-hospital mortality in patients without ST change in aVR lead, in patients with ST change less than 0.1 mV and in those with ST change more than 0.1 mV was 1.3%, 8.6%, and 19.4% with the increased risk for mortality in the latter groups with the Odds Ratios of 4.2 and 6.6, respectively. Taglieri et al. (23)revealed that the occurrence of ST depression in aVR lead resulted in increased risk for left main lesion (with odds ratio of 4.7) and for in-hospital mortality (with odds ratio of 5.6). Also, Raymond et al. (24)showed that each 1 mm increase in ST-depression could highlight the role of this change for predicting early mortality.

Thus , accordant to these information and results of our study , we can suggest ST change in aVR, both segment elevation and depression, is a valuable marker which can predict in hospital mortality and recurrent MI in patients with anterolateral MI or with non-STEMI. It can be useful to improve risk stratification beyond other risk predictors and it can help for selection of optimal management strategy.

References

1. Ryan TJ, Anderson JL, Antman EM, et al. ACC/AHA guidelines for the management of patients with acute myocardial infarction: executive summary. A report of the American College of Cardiology/American Heart Association

Task Force on practice guidelines (Committee on management of acute myocardial infarction). Circulation 1996;94:2341–50.

2. Bertrand ME, Simoons ML, Fox KA, et al. Management of acute coronary syndromes: acute coronary syndromes without persistent ST segment elevation. Recommendations of the Task Force of the European Society of Cardiology.Eur Heart J 2000;21:1406–32.
3. Arnold AER, Simoons ML. "Expected infarct size without thrombolysis", a concept that predicts immediate and long-term benefit from thrombolysis for evolving myocardial infarction. Eur Heart J 1997;18:1736–48.
4. Moshkovitz Y, Sclarovsky S, Behar S, et al. Infarct site-related mortality in patients with recurrent myocardial infarction. SPRINT Study Group. Am J Med 1993;94:388–94.
5. Braunwald E, Antman EM, Beasley JW, Robert M, Melvin D, Judith S, et al. ACC/AHA 2002 guideline update for the management of patients with unstable angina and non-ST segment elevation myocardial infarction: a report of the American College of Cardiology/American Heart AssociationTask Force on Practice Guidelines (Committee on the Management of Patients With Unstable Angina). Circulation. 2002;106:1893–1900.
6. Lee HS, Cross SJ, Rawles JM, Jennings KP. Patients with suspected myocardial infarction who present with ST depression. Lancet1993;342-1707-1714.
7. Cannon CP, McCabe CH, Stone PH, Rogers WJ, Schactman M, Thompson BW ,et al. The electrocardiogram predicts one-year outcome of patients with unstable angina and non-Q wave myocardial infarction: results of the TIMI III Registry ECG Ancillary Study. J Am Coll Cardiol 1997;33:133-40.
8. Haim M, Benderley M, Hod H, Reicher-Reiss H, Goldbourt U, Behar S .The outcome of patients with a first non-Q wave acute myocardial infarction presenting with ST segment depression, ST segment elevation ,or no ST deviations on the admission electrocardiogram.Int J Cardiol 1998'67:39-46
9. Diderholm E, Andrén B, Frostfeldt G, Genberg M, Jernberg T ,Lagerqvist B, et al. ST depression at entry indicates severe coronary lesions and large benefits of an early invasive treatment strategy in unstable coronary artery disease: the FRISC II ECG substudy. Eur Heart J. 2002;23:41–49
10. Solomon DH, Stone PH, Glynn RJ, Ganz DA, Gibson CM, Tracy R, et al .Use of risk stratification to identify patients with unstable angina likeliest to benefit from an invasive versus conservative management strategy. J Am Coll Cardiol. 2001;38: 969–976.
11. Pahlm US, Pahlm O, Wagner GS. The standard 11-lead ECG: neglect of lead aVR in the classical limb lead display. J Electrocardiol. 1996 ;29)suppl):270–27.
12. Khademvatani K, Basiri M, Alinejad V, Seyed Mohammad Zad MH, Prevalence and correlates of aortic root dilatation in patients with essential hypertension admitted to Seyedoshohada Hospital, Urmia 2012-2013. Journal of Global Pharma Technology. 2016; 02(8):01-06.
13. Seyed Mohammad Zad MH , khalili N, Alinejad V, Khadem Vatani K, Is There a Correlation Between Coronary Artery Ectasia and Neutrophil-Lymphocyte Ratio?. Journal of Global Pharma Technology. 2016; 02(8):01-06.
14. Khademvatan K, Alinejad V, Eghtedar S, Rahbar N, Agakhani N. Survey of the relationship between metabolic syndrome and myocardial infarction in hospitals of Urmia University of medical sciences. Glob J Health Sci. 2014 Sep 18;6(7 Spec No):58-65. doi: 10.5539/gjhs.v6n7p58.
15. Haghjoo M, Hajahmadi M, Fazelifar AF, Sadr-Amel MA, Efficacy and safety of different antitachycardia pacing sites in the termination of ventricular tachycardia in patients with biventricular implantable cardioverter-defibrillator. EuropaceVolume 13, Issue 4, April 2011, Pages 509-513.
16. Heris SO, Rahimi B, Faridaalaee G, Hajahmadi M, Sayyadi H, Naghipour B, QT dispersion after thrombolytic therapy. International Cardiovascular Research Journal, Volume 8, Issue 4, 1 December 2014, Pages 161-165
17. Rahimi Darabad B, Vatandust J, Pourmousavi Khoshknab MM,Hajahmadi Poorrafsanjani M. Survey of the effect of opioid abuse on the extent of coronary artery diseases. Global journal of health science, Volume 6, Issue 7, 2014, Pages 83-91.
18. Hajahmadi Poorrafsanjani M, Rahimi Darabad B, Evaluate the sensitivity and specificity echocardiography in trans-Doppler and tissue Doppler method in the estimation of left ventricular end-diastolic pressure. Global journal of health science, Volume 6, Issue 7, 2014, Pages 92-97.
19. Wong CK1, Gao W, Stewart RA, French JK, Aylward PE, Benatar J, White HD; Hirulog and Early Reperfusion or Occlusion-2 Investigators. Prognostic value of lead V1 ST elevation during acute inferior myocardial infarction.Circulation. 2010 Aug 3;122(5):463-9.
20. Kukla P1, Bryniarski L, Dudek D, Królikowski T, KaweckaJaszcz K. Prognostic significance of ST segment changes in lead aVR in patients with acute inferior myocardial infarction with ST segment elevation.Kardiol Pol. 2012;70(2):111-8.
21. Alherbish A1, Westerhout CM, Fu Y, White HD, Granger CB, Wagner G, Armstrong PW. The forgotten lead: does aVR ST-deviation add insight into the outcomes of ST-elevation myocardial infarction patients?Am Heart J. 2013 Aug;166(2):333-9. doi: 10.1016/j.ahj.2013.05.018. Epub 2013 Jul 1.

22. Barrabés JA1, Figueras J, Moure C, Cortadellas J, Soler-Soler J. Prognostic value of lead aVR in patients with a first non-ST-segment elevation acute myocardial infarction.Circulation. 2003 Aug 19;108(7):814-9. Epub 2003 Jul 28.
23. Raymond T Yan, Andrew T Yan, Kenneth W Mahaffey, Harvey D White ,Karen Pieper, Jie-Lena Su, Carl J. Prognostic utility of quantifying evolutionary ST-segment depression on early follow-up electrocardiogram in patients with non ST-segment elevation acute coronary syndromes. European Heart Journal (2010)31, 958–966.
24. Taglieri N, Marzocchi A, Saia F, Marrozzini C, Palmerini T, OrtolaniP,et al. Short- and long-term prognostic significance of ST-segment elevation in lead aVR in patients with non-ST-segment elevation acute coronary syndrome. Am J Cardiol. 2011 Jul 1;108(1):21-8.

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Age, year	65.38 ± 11.38	64.35 ± 12.69	64.08 ± 14.17	62.04 ± 13.85	0.770
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Current smoking	0.053	1.054	0.897