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Comparison of Clinical Data between Positive- and Negative-Patients in Treadmill Test for Diagnosis of Coronary Heart Disease

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Abstract. This study was designed to investigate differences in clinical data between positive- and negative-patients in treadmill test for patients with cardiovascular events. Total leukocyte and neutrophil counts, neutrophils/lymphocytes ratio and mean corpuscular volume were significantly higher, whereas platelet counts were lower in positive group than in negative group. Triglyceride and ALP concentrations were significantly higher in positive group than in negative group. The numbers of patients with abnormal levels of total cholesterol and HDL were higher in positive than in negative group, but is reverse in hyperglycemia. These data suggest that treadmill test-positive group had higher inflammation, myocardial injury, prevalence of angina pectoris and MI.

Keywords: Coronary artery disease, Treadmill test, hematological marker, Cardiac marker, Inflammatory marker, Biochemical

1 Introduction

Coronary heart diseases (CHD) have become major risk factor of increased mortality in adult population worldwide (Kones, 2011). Although treadmill test has been is utilized for the diagnosis of CHD, its specificity and sensitivity have been doubted. We studied to investigate differences physiological variables (clinical data) between positive- and negative-patients in treadmill test for the diagnosis of patients with cardiovascular events.

2 Materials and Methods

Two hundred patients with cardiovascular events participated in this study and were divided into two groups: negative group, which ST segment of electrocardiogram (EKG) is not changed in treadmill test (n=100) and positive group, which ST segment of EKG is changed in treadmill test (ST depression or elevation) (n=100).

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Hematological, biochemical, EKG findings, cardinal symptoms, final diagnosis and medical treatments were between two groups. This study was accepted from IRB of the Catholic University of Pusan. Unpaired *t*-test was applied for comparison of all variables between two groups. Statistical significance was accepted with $\boldsymbol{P} \leq 0.05$.

3 Results

Total leukocyte and neutrophil counts, neutrophils/lymphocytes ratio and mean corpuscular volume were significantly higher, whereas platelet counts were lower in positive group than in negative group (Table 1). Triglyceride and ALP concentrations were significantly higher in positive group than in negative group (Table 2). The numbers of patients chest pain combined dyspnea were more in positive than in negative group.

4 Discussion

Positive group in treadmill exercise had increased MCV, total leukocyte and neutrophil counts, N/L ratio as well as elevated triglyceride and ALP concentrations. Moreover, inflammatory and cardiac markers levels in positive group were obvious higher than those of negative group. The elevation of total leukocyte and neutrophil counts, neutrophils/lymphocytes ratio are associated with the development of CHA and mortality (Dregu et al., 2008; Sekitani et al., 2010). MCV levelis related to the development of MI (Myojo et al., 2011). Increased triglyceride and ALP concentrations are risk factors in CHA (Stauffer et al., 2013). These observations suggest that treadmill test is useful tool for diagnosis of CHD.

References

1. Kones, R.: Primary prevention of coronary heart disease: integration of new data, evolving views, revised goals, and role of rosuvastatin in management. A comprehensive survey. Drug Des Devel Ther, 2011, 5: 325-380.
2. Dragu, R., Huri S, Zuckeman R, Suleiman M. Mutlak D. Agmon Y. Kapeliovich M, Beyar R, Markidwicz W. Hammerman H, Aronson D. Predictive value of white blood cell subtypes for long-term outcome following myocardial infarction. Atherosclerosis, 2008, 196: 405-412.
3. Sekintani, Y. Hayashida, N, Kadota, K., Yamasaki, H., Abiru, N., Nakazato, M., Maeda, T., Ozono, Y., Takamura, N.: white blood cell and cardiovasculalr biomarkers of atherosclerosis. Biomarkers, 2010, 15: 454-460.
4. Myojo, M., Iwata, H., Kohro, T., Sato, H., Kiyosue, A., Ando, J., Sawaki, D., Takahashi, M., Fujita, H., Hirata Y, Nagai R. Prognostic implication of macrocytosis on adverse outcomes after coronary intervention. Atherosclerosis, 2012, 221: 148-153.
5. Stauffer, M. E., isenfluh L, Morrison A. Association between triglycerides and cardiovascular events in primary populations: a meta-regression analysis and synthesis of evidence. Vasc Health Risk Manag, 2013, 9: 671-680.

Table 1. Hematological variables in two groups

Variable	Group	
	Negative	Positive
T-leukocyte (10^3/μL)	6.46±2.03	7.03±1.87*
Granulocyte (10^3/μL)	3.77±1.63	4.18±1.59*
Lymphocyte (10^3/μL)	2.03±0.83	2.12±0.74
Monocyte (10^3/μL)	0.49±0.18	0.46±0.21
N/L ratio	1.85±0.97	1.96±0.85*
RBC (10^6/μL)	4.31±0.44	4.38±0.47
MCV (fL)	90.85±14.08	99.50±18.67*
Hemoglobin (g/dL)	13.37±1.42	13.57±1.56
Platelet (10^3/μL)	228.64±70.16	205.38±58.44*

Data are expressed as mean±SD. *, ***P***<0.05 (compared with the negative group).
Abbreviation: N/L ratio, neutrophils/lymphocytes ratio; T-, total; RBC, red blood cells; MCV, mean corpuscular volume.

Table 2. The number of patients with abnormal ranges of biochemical markers in two groups

Variable	Group	
	Negative	Positive
T-cholesterol (<186.5 mg/dL, no.)	26	38*
HDL (≤35 mg/dL, no.)	5	17*
Triglyceride (>150 mg/dL, no.)	28	34*
Glucose (>90 mg/dL, no.)	67	60*
AST (>40 IU/L, no.)	9	3*
ALT (>35 IU/L, no.)	12	17*

*, ***P***<0.05 (compared with the negative group). Abbreviation:
no., number; HDL, high density lipoprotein cholesterol; AST, aspartate aminotransferase; ALT, alanine aminotransferase.