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# Anti-Phosphatidylcholines and Anti-phosphatidylethanolamine Antibodies in ST elevated versus non-ST elevated Acute Myocardial Infarction

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**ABSTRACT: Introduction**: Many factors play a role in ischemia heart disease. One those anti-Phospholipid (aPL) antibodies, that may act in the induction of immunological response leading to the development of acute myocardial infarction (AMI). Anti-Phosphatidylcholines (PC) anti-phosphatidylethanolamine (PEA) antibodies are detected in various diseases like rheumatoid arthritis, systemic lupus erythematosus and anti-phospholipid antibody syndrome. The study of anti-PC and anti-PEA antibodies in AMI might clear etiologic mechanisms in the pathogenesis of ischemia heart disease. This study was conducted to investigate whether prevalence of anti-PC and anti-PEA antibodies, in patients who had ST-elevated AMI and in non ST-elevated AMI and to analyze their association with the type of AMI. **Materials and Methods**: The prevalence of anti-PC and anti-PEA antibodies IgG and IgM in a well characterized group of patients with ST-elevated and in non ST-elevated AMI were determined. Patients' sera were tested to evaluate the presence of IgG and IgM isotypes to anti-PC and also anti-PEA by ELISA method. **Results**: There were not seen significant differences between the prevalence of anti-PC and anti-PEA IgG, IgM in ST-elevated and in non ST-elevated AMI patients ($p>0.05$). **Discussion**: Our findings suggest that anti-PC and anti-PEA antibodies seemed to have not roles in type of AMI. Further investigations are recommended to explore the exact role of these antibodies in AMI.

***Keywords*:** Anti-Phosphatidylcholines (PC) antibodies, anti-phosphatidylethanolamine (PEA) antibodies, Acute Myocardial Infarction (AMI), anti-Phospholipid (aPL) antibodies.

## INTRODUCTION

Antiphospholipid antibodies (aPL) are associated with cardiovascular diseases. However their pathogenic mechanisms are still matter of research.

In addition to the Classical Lupus Anticoagulant (LAC) and Anti-Cardiolipin Antibodies (ACA), other anti-Phospholipid antibodies (aPL) were shown to be against anionic phospholipids and other plasma proteins (1).
Myocardial Infarction (MI) is the combined result of environmental factors and personal predispositions. Factors such as low annexin V levels (2) and infectious diseases such as Mycoplasma pneumonia (3) are a part of involving factors in AMI.

The results of some studies also demonstrated an association between anti-PL antibody and IHD (4, 5). It should be noted that genetic factors as well as other traditional risk factors such as smoking, hypercholesterolemia, diabetes mellitus and hypertension may contribute to IHD development and these parameters differ among various population.

Although there are a few studies on the association of some autoantibodies with AMI, more epidemiological data are required to confirm their significance as independent risk factors in cardiovascular diseases.

Moreover, the data on the relationship of autoantibodies with traditional risk factors of AMI is scarce. Therefore, this study was conducted to evaluate the serum levels of anti- Phosphatidylcholines (PC) and anti-phosphatidylethanolamine antibodies (IgG, IgM) in Iranian patients with ST elevated versus non ST elevated AMI.

## MATERIALS AND METHODS

***Subjects:***

A total of 90 consecutive patients (aged 41-67 years) with AMI including 67 men and 23 women who were admitted to Peymanieh Hospital of Jahrom in southwest of Iran, were enrolled to this study.

AMI was detected by the presence of two of these criteria: i) prolonged chest pain compatible with AMI, ii) typical ECG changes, iii) rising of cardiac enzymes such as creatine kinase and lactate dehydrogenase (6).

Exclusion criteria comprised valvular heart disease, surgery, trauma during the prior month, cardiomyopathy, liver disease, renal failure, arthritis, malignant diseases, other inflammatory diseases (such as SLE and RA) and oral anticoagulant therapy.

According to ECG AMI patients were divided to ST elevated and non ST elevated. Serum concentration of anti-PC and anti-PEA antibodies was measured during 3-5 days after admission.

The study protocol was approved by research ethics committee of Jahrom University of Medical Sciences and informed consents were obtained from all participants before enrollment.

Blood samples (5 cc) were obtained by venipuncture from the patients immediately after admission before starting any IV medications by skilled personnel. Isolated sera were frozen within almost 2 hours after collection and stored at -20°C until laboratory testing with ELISA.

Serum anti-PC and anti-PEA IgG, IgM levels was determined by quantitative and qualitative ELISA method respectively, following the manufacturer instructions using commercial kits.

Statistical analyses were performed by SPSS (version 11.5; SPSS, Inc., Chicago, IL). Data were expressed as mean±SD. Continuous variables with little-to-mild skewness were summarized as mean±SD and compared using Student's t-test.

## RESULTS AND DISCUSSION

***RESULTS***

The demographic and clinical characteristics of the study groups, as well as laboratory variables are shown in Table-1.

In the patient group 16 cases (18.80%) had Non-St Elevation MI (NSTEMI) and 74 (82.20%) had ST Elevation MI (STEMI).

Table 1. Demographic, clinical characteristics and laboratory finding for the patients

| Variables | Patients group |
|---|---|
| Age (year) | 9.63±62.66 |
| Male (%) number | 67) 74.40%( |
| High blood pressure (%) number | 39) 43.33%( |
| Smoker (%) number | 40) 44.40%( |
| IDDM * (%) number | 24) 26.70%( |
| Total cholesterol * Mg/dl | 40.30±176.13 |
| HDL-C * Mg/dl | 9.11±44.20 |
| LDL-C * Mg/dl | 36.32±118.05 |
| TG * Mg/dl | 72.18±126.53 |
| FBS * Mg/dl | 54.48±134.20 |
| Positive anti-PC IgG (%) number | 27) 30.00%( |
| Positive anti-PC IgM (%) number | 15) 16.70%( |
| Positive anti-PEA IgG (%) number | 11) 12.22%( |
| Positive anti-PEA IgM (%) number | 3) 3.33%( |

*IDDM=insuline dependent diabetes mellitus ,NIDDM=non- insuline dependent diabetes mellitus ,HDL-C=high density lipoprotein-cholesterol, LDL-C= low density lipoprotein-cholesterol, FBS=fasting blood sugar

There was not found any significant association between positive anti-PC and anti-PEA IgG, IgM tests with DM, age, sex, LDL, HDL, TG, total cholesterol and smoking.

There was not found significant difference between positive anti-PC and anti-PEA IgG,IgM tests in patients with STEMI and those with NSTEMI (table-2).

Table 2. prevalence of the autoantibodies in patients with STEMI and those with NSTEMI

| Variables | STEMI (%) | NSTEMI (%) | P-value |
|---|---|---|---|
| Positive anti-PC IgG | 73.30 | 25.90 | 0.186 |
| Positive anti-PC IgM | 74.10 | 26.70 | 0.324 |
| Positive anti-PEA IgG | 74.40 | 24.80 | 0.154 |
| Positive anti-PEA IgM | 67.10 | 23.70 | 0.434 |

***DISCUSSION***

The results of the present study showed that the prevalence of positive anti-PC and anti-PEA IgG, IgM were independent of traditional risk factors. We found high prevalence of anti-PC and anti-PEA antibodies in patients with STMI Vs NSTMI. However, the precise mechanisms of involvement of anti-Phospholipid antibodies in the pathogenesis of AMI remain to be determined.

We could not find any research finding about anti-PC and anti-PEA antibodies in AMI to compare its results with the results of present study.

There was not found association between anti- PC and anti-PEA IgG,IgM and standard cardiovascular risk factors such as smoking and diabetes, as seen about other apl antibodies in a previous study (4, 7).

As there were not significant differences between positive anti-PC anti-PEA antibodies test in patients with STEMI and those with NSTEMI, it can be concluded that these autoantibodies do not participate in kind of AMI (STEMI vs NSTEMI). But, unfortunately we did not any data indicating association of anti-PC and anti-PEA IgG,IgM with these parameters to compare the results.

## CONCLUSION

These results show these anti-PC and anti-PEA antibodies are indipent to traditional cardiovascular risk factors and do not participate in type of AMI (STEMI vs NSTEMI).

Further studies with larger sample size are recommended to explore the precise role of anti-PC and anti-PEA IgG and IgM in AMI.

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