The Change in Platelet Count in Patients with Acute Coronary Syndrome with Deformed Habits

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ABSTRACT *This study aimed to analyze change in platelet count in patients with acute coronary syndrome with deformed habits such as smoking, tobacco chewing and alcoholics.*

Total 296 adult (18 years above) patients with clinically suspected acute coronary syndrome who attended in cardiac emergency and admitted in coronary care unit in the department of Cardiology, King George's Medical University, India were enrolled in this study. Among them 200 patients had ECG changes (ST-elevation, ST-depression, T-inversion, appearance of Q-wave) with or without elevated troponin I and treated with anti-platelet drugs. They were considered as acute coronary syndrome patients. The subjects were divided into three groups according to their habits (smoking, tobacco chewing and alcoholics).

Comparing the mean of two groups (Present vs Absent) in cases of alcohoics, t test showed significantly (p<0.05) different and higher (PDW) and lower (PCT) while significantly (p<0.05) different in Alcoholics present group compared to alcoholics absent group. However, mean of rest parameters not differed (p>0.05) between the two groups (Present vs Absent) i.e. found to be statistically not significant.

It was observed that there were statistically significant differences (p<0.05) in all the parameters (PDW and PCT) estimated in drinkers while not in smokers and tobacco chewers.

Introduction:

Acute coronary syndromes (ACS) result from acute obstruction of a coronary artery. Consequences depend on degree and location of obstruction and range from unstable angina to non–ST-segment elevation MI (NSTEMI), ST-segment elevation MI (STEMI), and sudden cardiac death.

Platelets are the blood cells with variable sizes and densities. Platelet activation is a hallmark of acute coronary syndrome (1). It has been shown that platelets size, when measured as mean platelet volume (MPV), is a marker of platelet function and is positively associated with indicators of platelets activity. An increased MPV, an indicator of larger and more reactive platelets, has been associated with myocardial damage in ACS and has been found to be predictive of an unfavorable outcome among survivors of AMI (1-2).

Many factors can cause thrombocytopenia (a low platelet count). The condition can be inherited or acquired. This study aimed to measure platelet count in patients with acute coronary syndrome with deformed habits such as smoking, tobacco chewing and alcoholics.

Material and methods:

This study was conducted in Department of medicine, in collaboration with Department of Cardiology, King George's Medical University.

Total 296 adult (18 years above) patients with clinically suspected acute coronary syndrome who attended in cardiac emergency and admitted in coronary care unit in the department of Cardiology, King George's Medical University, India were enrolled in this study. Among them 204 patients had ECG changes (ST-elevation, ST-depression, T-inversion, appearance of Q-wave) with or without elevated troponin I and treated with anti-platelet drugs. They were considered as cases (group I). The rest 92 Patients had normal ECG findings, normal cardiac troponin I and did not receive anti-platelet therapy. They were considered as controls (group II). Clinical history, medical reports, findings and information were documented in a pre-designed data sheet with informed and written consent. Blood was collected aseptically for CBC and MPV with EDTA tube and determined by automated analyzer.

Statistical analysis:

Descriptive statistical analyses were performed using SPSS software (version 20, 2008). Data were summarized as Mean±SD. Groups (Present vs Absent (controls) were compared by unpaired or independent Student's t test. A two-tailed $p<0.05$ was considered statistically significant.

Results:

This study was carried out on 200 subjects of ACS with mean age of 58.89±12.17 years. Among them 163 males and 37 were females. The subjects were divided into three groups according to their habits (smoking, tobacco chewing and alcoholics).

Table 1. Mean and standard deviation (Mean ± SD) values of platelets count and platelet indices in the ACS (acute coronary syndrome) patients of smoking history present and absent (control) groups

Parameters	History of Smoking				P value
	Present (N=143)		Absent (N=57)		
	Mean	SD	Mean	SD	
Platelet count in lakhs	3.05	1.57	2.78	1.25	0.262
MPV (Mean Platelet volume)	8.59	1.37	8.51	0.47	0.672
PCT (Platelet crit)	0.36	0.28	0.33	0.25	0.394
PDW (Platelet distribution width)	9.61	3.37	9.58	2.61	0.959

The clinical lab values of Platelet count, MPV, PCT and PWD of ACS patients of smoking habits (Present vs Absent) at presentation is summarized in Table 1. Comparing the mean of two groups (Present vs Absent), t test showed mean of all parameters not differed (p>0.05) between the two groups (Present vs Absent) i.e. found to be statistically not significant.

Table 2. Mean and standard deviation (Mean ± SD) values of platelets count and platelet indices in the ACS (acute coronary syndrome) patients of Tobacco chewing history present and absent (control) groups

Parameters	History of Tobacco chewing				P value
	Present (N=39)		Absent (N=161)		
	Mean	SD	Mean	SD	
Platelet count in lakhs	3.23	1.77	2.91	1.41	0.237
MPV (Mean Platelet volume)	8.87	0.56	8.49	1.28	0.078
PCT (Platelet crit)	0.35	0.23	0.35	0.29	0.900
PDW (Platelet distribution width)	9.83	4.05	9.54	2.93	0.616

The clinical lab values of Platelet count, MPV, PCT and PWD of ACS patients of tobacco chewing habits (Present vs Absent) at presentation is summarized in Table 2. Comparing the mean of two groups (Present vs Absent), t test showed mean of all parameters not differed (p>0.05) between the two groups (Present vs Absent) i.e. found to be statistically not significant.

Table 3. Mean and standard deviation (Mean ± SD) values of platelets count and platelet indices in the ACS (acute coronary syndrome) patients of Alcoholics history present and absent (control) groups

Parameters	History of Alcoholics				P value
	Present (N=10)		Absent (N=190)		
	Mean	SD	Mean	SD	
Platelet count in lakhs	2.25	1.15	3.01	1.50	0.115
MPV (Mean Platelet volume)	8.84	0.32	8.55	1.21	0.455
PCT (Platelet crit)	0.17	0.10	0.36	0.28	0.030*
PDW (Platelet distribution width)	11.83	0.46	9.48	3.21	0.022*

*Significant.

The clinical lab values of Platelet count, MPV, PCT and PWD of ACS patients of Alcoholic (Present vs Absent) at presentation is summarized in Table3. Comparing the mean of two groups (Present vs Absent), t test showed significantly (p<0.05) result in case of PDW and PCT. However, mean of rest parameters not differed (p>0.05) between the two groups (Present vs Absent) i.e. found to be statistically not significant.

Discussion:
One of the most serious socioeconomic problems worldwide is alcoholism. It poses a major health hazard to human health because it is toxic to almost all the organs in the body and hence affects all the metabolic processes going on in the body.

Alcohol has anti-aggregatory effect on platelet suggesting the beneficial effect of alcohol in preventing coronary heart disease but when consumed moderately. It was also found that alcohol decreases both platelet aggregation and the circulating fibrinogen level (3).

Alcohol consumption has significantly affect platelet count in acute coronary syndrome patients. Similarly to this study, Hard and Ballard (4) said, apart from acquired immune deficiency syndrome (AIDS), alcoholism probably is the leading cause of thrombocytopenia. Moreover, alcohol-related thrombocytopenia generally is transient and platelet counts usually return to normal within one week of abstinence. Alcohol affects not only platelet production but also platelet function. Thus, patients who consume excessive amounts of alcohol can exhibit a wide spectrum of platelet abnormalities. These abnormalities include impaired platelet aggregation, decreased secretion or activity of platelet-derived proteins involved in blood clotting and prolongation of bleeding in the absence of thrombocytopenia.

While the other risk habits such as tobacco chewing and smoking doesn't seem a significant change on platelet count similar to other studies. Suwansaksri J et al. (5) observed that the platelet counts and platelet parameters of the subjects were not significantly different between smokers and non-smokers. Butkiewicz AM et al. (6) noted that women are more sensitive to smoking than men. Platelets in male smokers are less sensitive to smoking--the study showed no significant changes in the parameters. Snuff use did not lead to an increased interaction of platelets and vessel walls or cause platelet activation (7).

In conclusion, alcohol consumption has some beneficial effect if it is consumed occasionally, but the evil effect to body is more than its benefit.

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