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Original Research Article

Analysis of ECG Finding among Patients under 45 Years Admitted to the CCU in the Department of Medicine

Pragati Prabhat[1], Raj Kumar Deepak[2]

[1]Senior Resident, Department of General Medicine GMCH, Bettiah
[2]Assistant Professor & Head, Department of General Medicine GMCH, Bettiah

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Corresponding Author: Dr. Rajkumar Deepak
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Abstract:

Background: ACS refers to a spectrum of clinical presentations includingUnstable Angina (USA), Non ST Elevated Myocardial Infarction (NSTEMI) and ST Elevated MyocardialInfarction (STEMI). To study ECG finding of patients of ACS aged ≤ 45 years admitted in CCU of Department of General Medicine.

Methods: The hospital based observational study was carried out in patients of ACS aged ≤ 45 years, admitted to Cardiac Care Unit(CCU) of Department of General Medicine, at GMCH, Bettiah. Study duration is One years.

Results: T wave inversion in most leads was commonest ECG finding present in 36(72%) of patients. was present in 32(64%) patients, ST elevation in 28(56%) patients and Q waves were seen in 11(22%) patients. Out of 50 patients, 39 had normal heart rate, 6 had bradycardia and 5 patients had tachycardia. Out of 6 patients with bradycardia 3 had STEMI, 1 had NSTEMI and 2 had USA. Out of 5 patients with tachycardia, 2 had STEMI and 3 had NSTEMI.

Conclusion: In ACS in young, T wave inversion was most common finding.

Keywords: ACS, LAD, ECG.

Introduction

ACS refers to a spectrum of clinical presentations includingUnstable Angina (USA), Non ST Elevated Myocardial Infarction (NSTEMI) and ST Elevated MyocardialInfarction (STEMI). ACS patients with new evidence of ST-segment elevation should be considered for immediate reperfusion therapy by thrombolytics or percutaneouscoronary intervention (PCI); those without ST-segment elevation but with evidence of myonecrosis are deemed to have a NSTEMI, and those without any evidence of myonecrosis are diagnosed as USA. [1,2] The underlying mechanism responsible for the ACS is usually the formation of an occlusive or sub-occlusive mural thrombus overlying an injured vessel wall or a ruptured atherosclerotic plaque. Plaque stabilization due to adecrease in the lipid content of the vulnerable lesions and improved endothelial function are two mechanisms that could partly account for the reduction in coronary events with cholesterol lowering therapy. Circulating platelets are implicated in mural thrombus formation at the site of aplaque rupture and platelets become hyper-reactive in the presence of hypercholesterolemia. [3]

Material and Methods

The hospital based observational study was carried out in patients of ACS aged≤ 45 years, admitted to Cardiac Care Unit (CCU) of Department of Medicine GMCH, Bettiah. Total of 50 cases (male= 44, female= 6) of young ACS were included in study.

Inclusion Criteria

1) Age of patient was 45 years or below.
2) Patients who fulfilled the criteria of Acute Coronary Syndrome were included

I. Acute, evolving, or recent MI defined as the typical rise and/or fall of biochemical markers of myocardial necrosis with at least one of the following:

a) Symptoms of ischemia.
b) Electrocardiographic changes indicative of ischemia and/or infarction.
c) Development of pathologic Q waves in the ECG.
d) Imaging evidence of new loss of viable myocardiumor new regional wallmotion abnormality.

II. Unstable Angina (USA) was defined as angina pectoris (or equivalent type of ischemic discomfort) with at least one of three features:

a) Occurring at rest (or minimal exertion) and usually lasting >10 minutes.
b) Being severe and of new onset (i.e. within the prior 4- 6wks).
c) Occurring with a crescendo pattern (i.e., pain that
prolonged, or frequent than previously).

III. NSTEMI- If a patient with USA develops evidence of myocardial necrosis, as reflected in eleva 5th ed cardiac biomarkers.

Exclusion Criteria

Patients not giving informed consent.
Patients with advanced co morbid conditions, including malignancies, advanced heart failure or valvular heart diseases.
Patients already on statins.
Patients with secondary causes of cardiovascular diseases
like thyroid disorder, renal disorders, liver disorders, Cushing's syndrome, on estrogen administration which affectlipid metabolism.
Patients with expected transfer to another hospital within 48hours or if followup not possible.

Statistical analysis

Data collected was managed on a Microsoft Excel spreadsheet. All analysis was performed with the SPSS 10 version. Data were expressed using mean± standard deviation for continuous variables and frequency (percentage) was used to describe distribution of categoricalvariables. Association of risk factors of disease was carriedby using Chi- Square Test.

Results

Table 1: distribution of patients according to ECG findings

ECG Findings	No. of Patients	Percentage
T wave inversion	36	72%
ST depression	32	64%
ST elevation	28	56%
Q waves	11	22%

T wave inversion in most leads was commonest ECG findingpresent in 36(72%) of patients. ST depression was present in 32(64%) patients, ST elevation in 28(56%) patients and Q waves were seen in 11(22%) patients. Out of 50 patients, 39 had normal heart rate, 6 had bradycardia and 5 patients had tachycardia. Out of 6 patients with bradycardia 3 had STEMI, 1 had NSTEMI and 2 had USA. Out of 5 patients with tachycardia, 2 had STEMI and 3 had NSTEMI.

Discussion

ECG was abnormal in 44 (88%) patients. Twenty-eight(56%) patients were having ST elevation in ECG, 32(64%) ST depression, 36(72%) T wave inversion and 11 (22%) Q waves were other ECG changes noted. As most of the patients had overlapping changes in ECG 23(46%) were diagnosed ST elevated MI, 14(28%) NSTEMI and 13(26%)USA. ECG changes in MI patients further divided into subgroups STEMI, NSTEMI and USA. ECG was normal in 6(12%) patients of USA and ST depression alone was present in 9 patients of NSTEMI.T wave inversion alone is found in 3 patients of NSTEMI and 3 patients of USA. Q waves alone were found in 1 patient. ST elevation and ST depression was found in 7 patients of STEMI. ST depression and T wave inversion was found in 4 patients of NSTEMI. ST elevation and T wave inversion was found in 6patients of STEMI. ST elevation, depression and T wave inversion was found in 2 patients of STEMI. T wave inversion and Q waves were found in 3 patients of NSTEMI. ST elevation, depression, T wave inversion and Q waves are found in 1 patient. ST depression, T wave inversion and Q wave is found in 1 patient of NSTEMI. ST elevation with Q waves is found in 3 patients of STEMI. ECG was normal in 6(12%) patients. Similar ECG changes were seen in a study by Wang Y et al in a study on ECG changes in young patients of MI. [4]

Conclusion

In ACS in young, T wave inversion was most commonfinding.

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