ORIGINAL RESEARCH PAPER

Volume-7 | Issue-6 | June-2018 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PREVALENCE OF NORMAL EPICARDIAL CORONARIES IN TREADMILL TEST POSITIVE PATIENTS

Cardiology

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ABSTRACT

Need of the study: Coronary artery disease are increasing across the world due to increase in obesity, dyslipidemia, diabetes mellitus, hypertension (Syndrome X). Myocardial ischemia is in these group of patients are underestimated. Treadmill test in these patient is valid tool to diagnose the coronary artery disease. Patients with angina with positive stress electrocardiogram may have normal coronary angiogram. Reason for normal coronary angiogram in the background of angina may be due to vasospasm, microvascular dysfunction. Normal coronary angiogram following abnormal exercise stress test puts patientsat higher risk of developing future coronary heart disease. Even with no occlusion in coronary arteries, patients are at risk of recurring coronary events such as myocardial infarction and death.

Aim: The objective of this study is to analyze the prevalence of normal epicardial coronary artery by conventional coronary angiogram (CAG) in patients with positive treadmill test.

Materials & methods: It is a prospective observational study done in our Institute of Cardiology, RGGGH & Madras Medical College, Chennai from March 2017 - Sep 2017 on 110 exercise stress electrocardiogram positive patients with initial presentation of atypical angina. These patients were subjected to invasive coronary angiogram after excluding the contraindications at our Institute.

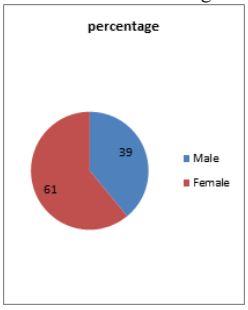
Results: Out of 110 TMT positive patients, 34 % patient had normal epicardial coronaries on CAG. Out of this proportion, 61 % were female and 39% patients were male. In female population, subgroup analysis showed 26% were in pre menopausal stage. Average age of our study population was 52 years. Risk factor analysis, hypertension (52%) was predominant then diabetes (39%), dyslipidemia (36%). On hemodynamic response analysis 58% study population showed exaggregated systolic BP response during the stress test. Target heart rate was achieved in all patients. On functional capacity analysis, majority of patients achieved good exercising capacity with MET of average 9 METS. No angina or arrhythmia or hemodynamic compromise during the study.

Conclusion: Treadmill test is effective tool in diagnosing ischemic heart disease in high risk population. In our study of about 34% patients who showed positive stress electrocardiogram with atypical angina had normal epicardial coronaries. Normal coronary artery patients are predominantly female with hypertensive response during the test. Reason for angina in these patients may be due to vasospasm or microvascular dysfunction. These patients may be appropriate candidates for formal studies of vascular function and aggressive risk factor modification.

KEYWORDS

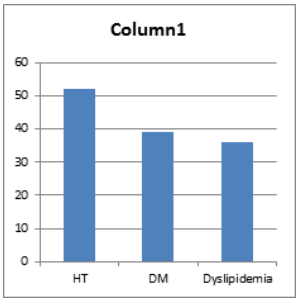
TMT – treadmill test, CAD – coronary artery disease CAG – coronary angiogram

Exercise testing is an important diagnostic as well as prognostic procedure in the assessment of patients with cardiovascular disease. With advent of coronary angiography, the role of exercise testing in diagnosis of ischemic heart disease became limited. In analyzing the results of exercise electrocardiogram, ST segments changes was the major determinant factor. Criteria for myocardial ischemia in TMT is based on the horizontal ST segment depression observed when both the J point and ST 80 depression are 1mm (0.1mV) or greater and ST segment slope is within the range of 1.0mV/sec[6]. In case of down sloping ST segment depression the test is positive when the J point and ST 80 depression are 1mm (0.1mV) and the ST segment slope is – 1.0 mV/sec in three consecutive beats of at least a single lead[6].



Materials and methods:

It is a prospective observational study done in our Institute of Cardiology, RGGGH & Madras Medical College, Chennai from March 2017 - Sep 2017 on 110 exercise stress electrocardiogram positive patients. We used Bruce protocol to validate the study. 110 patients were included in our study after firm implementation of exclusion criteria as per standard protocol. Treadmill test was carried out by Schiller treadmill test machine. Coronary angiogram was done with Toshiba cath lab machine and Iohexol was the standard contrast medium .



Results:

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Discussion:

For decades angina with normal epicardial coronary arteries are largely viewed by as unrelated to true myocardial ischemia but rather a non cardiac cause. Recent studies reveal myocardial ischemia can occur without any critical obstructive coronaries. Etiology for myocardial ischemia in this group are multifactorial such as endothelial dysfunction, coronary vasospasm, metabolic abnormalities of myocardium. According to various review articles, hypertension is associated with two fold to threefold increase risk to develop TMT positive and normal CAG. The same finding was reported by Zeina AR et al study 17where incidence of hypertension increases with increase in TMT positive and normal CAG status. This could be explained by the fact that hypertension is associated with adverse changes in the structure and function of arterial walls because they interfere with the normal functioning of microcirculation as well as the epicardial coronary arteries leading to Left ventricular hypertrophy and Ischemia. Dyslipidemia is a significant risk factor of TMT positive and normal CAG in both sexes, but more for women. These patients are often benefited by aggressive modification of risk factors and vascular function assessment.

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