Section: Cardiology

Original Research Article

PROSPECTIVE STUDY OF ECG AND ANGIOGRAPHIC PROFILE OF CAD PATIENT ADMITTED AT EKASHILAA HOSPITAL

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ABSTRACT

Background: As coronary artery disease is asymptomatic, it may cause unexpected morbidity and mortality; hence, invasive coronary tomographic angiography (CCTA) and noninvasive electrocardiography are used to rule out structural and functional occlusion of coronary artery disease. **Materials and Methods:** 540 adults were diagnosed as having IHD. Clinical examination included ECG, 2D-Echo, and coronary angiography. The blood examination, RBS, troponin-I, CK-MB lipid profile, and CRP were carried out. **Result:** ECG findings have 270 (50%) T-wave inversions, 195 (36%) normal, 38 (7%) ST depressions, 17 (3.1%) QS patterns, and 20 (3.7%) ST elevations. Coronary angiography findings were 150 (27.7%) normal with no vessels, 232 (42.9%) SVD, 131 (24%) DVD, and 27 (5%) TVD. Association of ECG and coronary angiography had 270 T-wave inversions, 195 normal, 17 QS patterns, 37 ST depressions, and 21 ST elevations. **Conclusion:** Coronary angiographic technique is more ideal than ECG, which may offer a better solution for the clinical problem of the diagnosis for CAD, but ECG does not mention stenosis but highlights the function of CAD.

INTRODUCTION

"In earlier times starvation consigned languishing bodies to death; nowadays prosperity plunges them into the grave."

Coronary artery disease (CAD) is the leading cause of morbidity and mortality in both developed and developing countries.[1] Coronary atherosclerosis involves a prolonged asymptomatic developmental phase, with its clinical manifestation often resulting in ischemic heart disease (IH), acute myocardial infarction, or cardiac death.[2] In addition to invasive coronary angiography (ICA), which is the reference standard for assessing anatomical stenosis severity, a variety of non-invasive testing methods have been advocated. Available methods include exercise stress electrocardiography (EXECG), single proton emission computed tomography (SPECT), myocardial perfusion imaging (MPI), and coronary computed tomography (CCTA). Despite these facts, assessment of the presence of CAD remains challenging.[3]

Among these diagnostic methods, ECG is a well-established and inexpensive procedure to evaluate intermediate-risk patients with angina pectoris.[4] Hence, ECG and coronary angiography techniques were used to evaluate the IHD and later stages of myocardial infarction.

MATERIALS AND METHODS

540 adult patients aged between 35-70 years admitted to Ekashilaa Hospital near the Ashoka Hotel opposite the KUDA office in Hanamkanda (dist), Telangana, due to IHD were studied.

Inclusion Criteria

18 years old and diagnosed with IHD as per the guidelines of the European Society of Cardiology and the American College of Cardiology (2000). The patients who gave their consent in writing for the study were selected for the study.

Exclusion Criteria

Patients with previously known valvular heart disease, valve replacement, congenital heart disease, non-ischemic cardiomyopathy, and those who had previously undergone coronary. Patient's refusal to give consent were excluded from the study.

Method: Total 540 adult patients diagnosed with IHD, irrespective of gender every patients was informed about the purpose, procedure, risks, and benefits of involvement in the study. Clinical examination included ECG, 2D-Echo, and coronary angiography were carried out.

A positive ECG for ischemia was considered if the resting or exercise ECG showed ST depression, ST elevation, T-wave inversion, or LBBB. Coronary

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angiography was done for each patient under local anesthesia from a femoral approach using a Phillips catheter. Lab machine coronary angiograms were usually assessed in different orthogonal views and analyzed. The angiographic results were sorted to assess the severity of atherosclerotic disease as normal coronary angiogram, single-vessel disease, two-vessel disease, and three-vessel disease. Normal coronary angiography is considered if the three coronary arteries (right, left anterior descending circumflex, and left main stem coronary arteries) had 0% stenosis. Single-vessel disease is considered if one of the three coronary arteries has at least a 70% degree of luminal narrowing on angiography. Double vessel disease was considered if two coronary arteries had at least 70% stenosis on angiography. Triple vessel disease was defined as three coronaries, LAD, RCA, and LCX, having at least 70% stenosis in each. The duration of the study was from March 2024 to May 2025.

Statistical Analysis: Clinical manifestation of IHD patients ECG findings and coronary angiography findings. The association of ECG and angiography studies was classified with percentages. The statistical analysis was carried out using SPSS software. The ratio of male and female was 2:1.

RESULTS

[Table 1] Clinical manifestation: 420 (77.7%) dyspnea, 307 (56.8%) chest pain, 134 (24.8%) palpitation, 116 (21.4%) giddiness, 76 (14%) sweating, 189 (35%) alcoholism, 135 (25%) obesity, 135 (25%) hyperlipidemia, 103 (19.7%) smoking, and 108 (20%) tobacco chewing.

[Table 2] Study of ECG findings in IHD patients: 270 (50%) T-wave inversion, 195 (36%) Normal ECG finding, 38 (7%) ST depression, 17 (3.1%) QS Pattern, 20 (3.70%) ST elevation

[Table 3] Study of coronary angiography findings in IHD patients

- Normal: 150 (27.7%) no vessels,
- SVD: 107 (19.8%) LAD, 60 (11%); LCX, 48 (8.8%); RCA, 17 (31%); OM
- In DVD: 65 (12%) LAD-RCA, 38 (12%) LCX-RCA, 17 (3.1%) LCX-LAD, 11 (2%) LAD.
- TVD: 27 (5%) LAD-LCX-RCA

[Table 4] Association of ECG and coronary angiography among IHD patients

- ECG Patients: T-wave inversion – 65 (24%) normal, 130 (48%) SVD, 48 (17%) DVD, 27 (10%) TVD
- In normal ECG: 71 (36%) normal, 75 (38.4%) SVD, 49 (25%) DVD,
- QS Pattern had 17 (3.1%) DVDs.
- ST depression: 15 (40%) normal, 6 (16.2%) SVD, 16 (43%) DVD
- ST Elevation: 21 (100%) SVD

Table 1: Clinical Manifestations of Ischemic heart patients

Sl. No	Clinical Manifestations	No. of patients (540)	Percentage (%)
1	Dyspnea	420	77.7
2	Chest pain	307	56.8
3	Palpatation	134	24.81
4	Giddiness	116	21.4
5	Sweating	76	14
6	Alcoholism	189	35
7	Obesity	135	25
8	Hyperlipidemia	135	25
9	Smoking	103	19.7
10	Tobacco	108	20

Table 2: Study of ECG Findings in IHD patients

Sl. No	ECG Findings	No. of patients (540)	Percentage (%)
1	T-wave inversion	270	50
2	Normal	195	36
3	ST Depression	38	7
4	QS Pattern	17	3.1
5	ST Elevation	20	3.70
	Total	540	100

Table 3: Study of Coronary angiography findings in IHD patients

Diagnosis on Angiography	Diseased Vessel	No. of patients (540)	Percentage (%)
Normal	No Vessel	150	27.7
SVD	LAD	107	19.8
	LCX	107	19.81
	RCA	48	8.8
	OM	17	3.1
DVD	LAD-RCA	65	12
	LCX-RCA	38	7
	LCX-LAD	17	3.1

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	LAD	11	2
TVD	LAD-LCX RCA	27	5
	Total	540	100

Table 4: Association of ECG and Coronary angiography findings among IHD patients

ECG Findings	Coronary Angiography				Total
	Normal	SVD	DVD	TVD	
T-wave inversion	65 (24%)	130 (48%)	48 (17%)	27 (10%)	270
Normal	71 (36%)	75 (38.4%)	49 (25%)	0	195
QS pattern	0	0	17 (100%)	0	17
ST depression	15 (40%)	6 (16.2%)	16 (43%)	0	37
ST Elevation	0	21 (100%)	0	0	21
Total	151	232	130	27	540

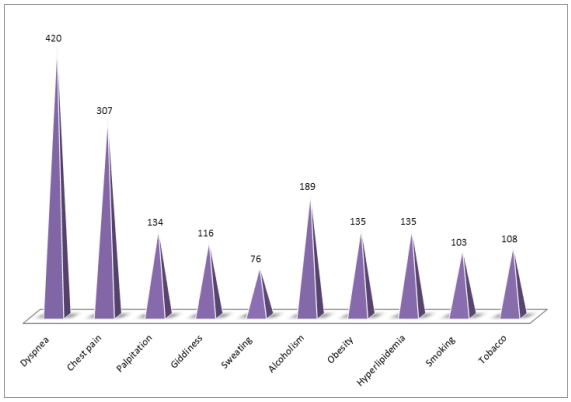

Figure 1: Clinical Manifestations of Ischemic heart patients

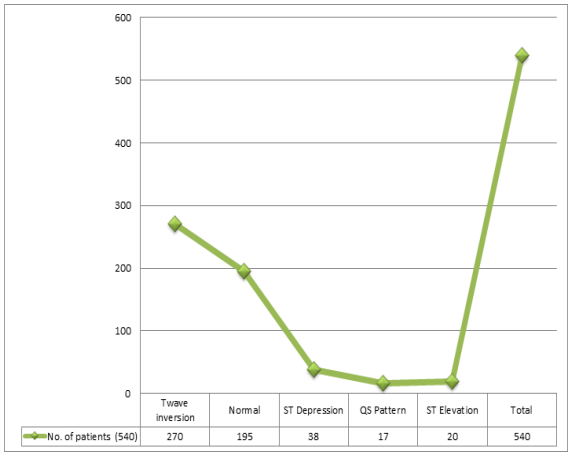

Figure 2: Study of ECG Findings in IHD patients

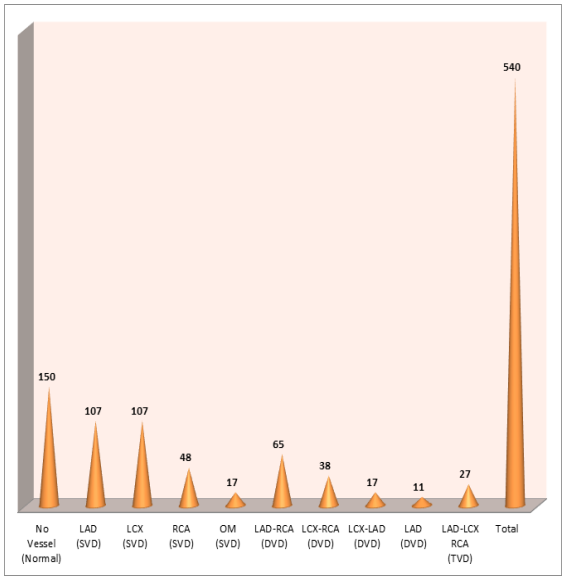

Figure 3: Study of Coronary angiography findings in IHD patients

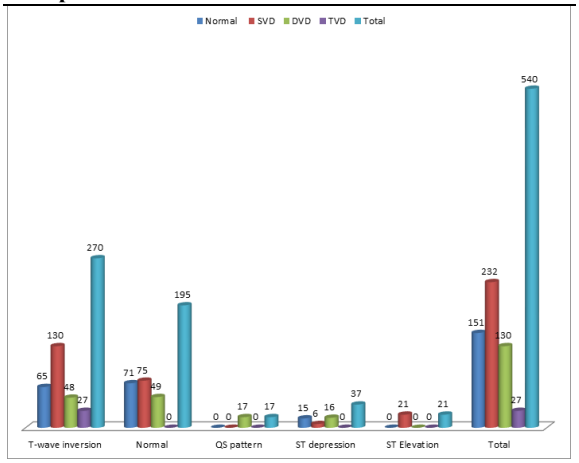

Table 4: Association of ECG and Coronary angiography findings among IHD patients

DISCUSSION

The present study of ECG and angiographic profiles of ischemic heart disease patients admitted was studied. The clinical manifestations were 420 (77.7%) had dyspnea, 307 (56.8%) had chest pain, 134 (24.8%) had giddiness, 76 (14%) had sweating, 189 (35%) were alcoholic, 135 (25%) were obese, 135 (25%) had hyperlipidemia, 103 (19.07%) were smokers, and 108 (20%) were tobacco chewers [Table 1]. The ECG findings were 270 (50%) T-wave

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inversions, 195 (36%) were normal, 38 (7%) had ST depression, 17 (3.1%) had QS patterns, and 20 (3.70%) had ST elevation [Table 2]. The coronary angiographic findings were that 150 (27.7%) were normal, 232 (42.9%) had SVD, 131 (24.2%) had DVD, and 27 (5%) had TVD [Table 3]. The association of ECG and coronary angiography had 270 T-wave inversions; 195 were normal, 17 had QS patterns, and 37 had ST depression [Table 4]. These findings are more or less in agreement with previous studies.[5-7]

In the analysis, it is focused on the diagnostic performance of prospective ECG-gated coronary angiography for the detection of obstructive coronary artery disease. Firstly, the mean assessable segments of prospective ECG gating are very high (98%), and this indicates a very high value of prospective ECG gating for evaluation of coronary arteries.[8] Various factors that are thought to contribute to the rising CAD epidemic include urbanization of rural areas, large-scale migration of rural populations to urban areas, an increase in sedentary lifestyles, abdominal obesity, metabolic syndrome, type II DM, inadequate consumption of fruits and vegetables, increased use of fried, processed, and fast food, tobacco abuse, poor awareness and control of CAD risk factors, unique dyslipidemia (high TGs and low HDL-C levels), and possible genetic predisposition. The incidence of CAD in younger groups has been rising in India, especially in males.[9] The disease is associated with considerable morbidity, psychological changes, and a financial burden for the individual and family, especially when it affects the young individual. Male sex is more prone to CAD when compared to their premenopausal female counterparts.[10]

In the present study, IHD type II DM patients cannot be ignored. The majority of undiagnosed diabetic patients are more prone to IHD and MI because many young adults are unaware of their diabetic symptoms due to a lack of disease awareness; hence, diabetics exhibit a tendency towards more than one vessel involvement in cardiovascular diseases.[11]

CONCLUSION

Present perspective study of ECG and angiographic profile of IHD patients admitted. Coronary angiographic study in the diagnosis of coronary artery disease has higher sensitivity and specificity than ECG, which may offer a better solution for the clinical problem of diagnosis of CAC. It is worth mentioning that ECG does not measure stenosis degree, but functional CAD is preliminarily highlighted by ECG. The present study demands further genetic, environmental, nutritional, angiologic, neurotransmitter, and psychological studies because the exact cause of coronary artery disease is still unclear.

Limitation of study: Owing to remote location of research centre, small number of patients, lack of latest techniques we have limited finding and results.

REFERENCES

1. Haines A, Patterson D: Prevention of cardiovascular diseases occas. pap. R. Coll. Gen. Pract. 1992, 58; 67-78.
2. VAZ FS, Ferreira AM: Utility of logistic to estimate prognosis in patients with acute myocardial infarction. Ind. J. of Science and Nature.
3. Nagamalash UM, Prakash VS, Hagde AV: Cross-sectional observational cordial infarction. Int. J. 2013, 5 (5); 69-77.
4. Singh PS, Singh G: Clinical profile and risk factors in acute coronary syndrome. Ind. Acad. Clin. Med. J. 2013, 14 (2); 130-2.
5. Sharma R, Bhairappa S: Clinical characteristics, angiographic profile, and in-hospital mortality in acute coronary syndrome patients. Heart India 2014, 2; 65-9.
6. Zadpsy SP, Shrikhande SN: Risk factors for acute myocardial infarction in antral India Ind. J. Community Med. 215, 40; 19-26.
7. Gianross R, Detrano R: Exercise-induced ST depression in the diagnosis of coronary artery disease circulation 1989, 80; 87-98.
8. Raff GL, Gallgher MJ: Diagnostic accuracy of non-invasive coronary angiography using 64-slice spiral computed tomography J. Am. Coll. Cardiol. 2005, 46; 552-557.
9. Enas EA, Singh V: Reducing the burden of coronary artery disease in India: challenges and opportunities Heart J. 2008, 60, 161-75.
10. Yusuf S, Hawken S: Effect of potentially modifiable risk factors associated with myocardial infarction. Lancet 2004, 364; 937-52.
11. Matheus AS, Tanus LR: Impact of diabetes on cardiovascular disease Ind. J. Hypertension 2013, 13; 65-78.

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