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Original Research Article

To study the correlationship of Coronary Artery Disease with common co-morbid illness like Diabetes Mellitus, Hypertension in patients aged >45 years

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Abstract:
Background & Method: The aim of the study is to study the correlationship of Coronary Artery Disease with common co-morbid illness like Diabetes Mellitus, Hypertension. Detailed history, clinical examination, electrocardiography findings, echocardiography findings to be studied. Correlation of risk factors including age, addiction history, other comorbidities etc with the angiographic findings.
Result: Among non-diabetics, the most common finding was Single vessel disease=Double vessel disease (24.5% each) followed by Triple vessel disease. Diabetics are found to have multiple vessels involvement more often as compared to non-diabetic population. The p value is 0.013 which is statistically significant showing that the risk for CAD/ACS increases significantly with the presence of Diabetes Mellitus. 57 out of 100 participants were having Hypertension. Out of 57 hypertensives, the most common angiogaphic pattern was Triple vessel disease=Double vessel disease(31.6% each), followed by Single vessel disease (21.1%). 14% hypertensives had non-critical CAD while 1.8% had normal angiography. Among non-hypertensives, the most common finding was non-critical CAD (25.6%) followed by Normal=Single vessel disease (23.3% each). Hypertensives are found to have multiple vessel involvements more often as compared to non-hypertensive population. The p value is 0.001 which is statistically significant showing that the risk for CAD/ACS increases significantly with the presence of Hypertension.
Conclusion: Chest pain is the most common presenting symptom in patients of CAD which can be associated with diaphoreis, uneasiness etc but atypical site or character of pain should never be neglected specially if the patient is diabetic. Diabetes, Hypertension & dyslipidemia were the most prevalent modifiable risk factors while male gender & positive family history were non-modifiable risk factors associated with CAD.

Keywords: Correlationship, CAD, DM, hypertension.

Study Designed: Observational Study.

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1. Introduction

In India, CVDs have been leading cause of morbidity and mortality. Recent trends suggest that disease incidence has escalated and has started affecting younger age group also[1]. Incidence of CVD's has been on increasing trend not only in urban areas but in rural areas also. Its prevalence was estimated to be 3-4% in rural population and 8-10% in urban population, based on cross sectional surveys[2]. If future trends are considered prevalence of CVDs may get doubled in coming 20 years in both rural and urban populations of India.
Amongst the many diseases that comprise cardiovascular diseases (CVD's) coronary artery disease (CAD) is the leading cause of mortality and morbidity, others being hypertensive heart disease, cerebrovascular diseases, peripheral vascular diseases, valvular heart diseases and congenital heart disease[3].
Many traditional risk factors for coronary artery disease (CAD) are related to lifestyle, and preventative treatment can be tailored to modifying specific factors[4].
The risk of developing CAD increases with age, and includes age greater than 45 years in men and greater than 55 years in women. A family history of early heart disease is also a risk factor, including heart disease in the father or a brother diagnosed before age 55 years and in the mother or a sister diagnosed before age 65 years[5].

2. Material & Method

The present study included patients attending the Dept. of Cardiology, J.A. Group of Hospitals, Gwalior undergoing coronary angiography and angioplasty from Jan 2020- June 2021.
Detailed history, clinical examination, electrocardiography findings, echocardiography findings was studied. Correlation of risk factors including age, addiction history, other comorbidities etc with the angiographic findings was done. Statistical analysis was be done using SPSS 2.0 and graphs generated by Microsoft Excel and Word. (A p- value of less than 0.05 was considered significant)

Inclusion Criteria
1. All the patients undergoing coronary angiography and angioplasty who are >45 years age in the Dept of Cardiology, JA Group of Hospitals during the stipulated study period from Jan 2020 to June 2021 will be included in the study.

Exclusion Criteria
1. Patients who refused to give written informed consent
2. Patients <45 years of age

3. Results

Table 1: Gender wise distribution of study participants

Gender	N	%
Male	83	83%
Female	17	17%
Total	100	100%

Among studied 100 patients, 83 were males and 17 were females.

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Table 2: Sign and Symptoms wise distribution of study participants

Sign and Symptoms		N	%
Chest Pain	Yes	81	81%
	No	19	19%
Breathlessness	Yes	13	13%
	No	87	87%
Ghabrahat	Yes	40	40%
	No	60	60%
Sweating	Yes	13	13%
	No	87	87%
Atypical complaints	Yes	11	11%
	No	89	89%
Pulmonary Edema	Yes	21	21%
	No	79	79%
Raised JVP	Yes	8	8%
	No	92	92%

Out of 100 study participants who underwent angiography with or without angioplasty, chest pain was the present initially in 81% patients, 40% patients complained of ghabrahat (feeling of uneasiness), sweating was present in 13% participants, breathlessness was present in 13%, atypical complaints/location was present in 11% participants.

On examining the patients, pulmonary edema was present in 21% patients, 8% patients had raised JVP suggestive of acute left ventricular failure.

Table 3: Distribution of study participants according to risk factors

Risk factors		N	%
Smoking	Yes	47	47%
	No	53	53%
Alcohol	Yes	11	11%
	No	89	89%
Tobacco Chewing	Yes	34	34%
	No	66	66%
BMI	Normal (18.5-22.9)	58	58%
	Overweight (23-24.9)	28	28%
	Obese (≥25)	14	14%
Family History	Yes	20	20%
	No	80	80%

Out of 100 study participants who underwent angiography/angioplasty, 47 had history of smoking present while 34 participants were tobacco chewers. 11 study participants were alcoholics. Therefore, among the addictions, most prevalent addiction was smoking followed by tobacco chewing followed by alcohol.

Out of 100 participants, 14 were obese (BMI ≥25 as per Indian standards), 28 were overweight (BMI 23-24.9), while 58 (majority) were having normal BMI.

20 patients had positive family history for coronary artery disease

Table 4: Co-morbidities among study participants

Co-morbidity		N	%
Hypertension	Yes	57	57%

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	No	43	43%
Diabetes Mellitus	Yes	47	47%
	No	53	53%
Dyslipidemia	Yes	45	45%
	No	55	55%
COPD	Yes	13	13%
	No	87	87%

Out of 100 study participants, 57 were found to be hypertensive (known cases + newly diagnosed). 47 out of 100 participants were having Diabetes Mellitus, 45 out of 100 had dyslipidemia

Table 5: Association between CAD and Diabetes Mellitus

Angiogram findings	**Diabetes Mellitus**		**P Value**
	Yes N (%)	**No N (%)**	
Normal	2 (4.3%)	9 (19%)	0.013
Non-critical CAD	6 (12.8%)	13 (24.5%)	
SVD	9 (19.1%)	13 (24.5%)	
DVD	13 (27.7%)	12 (22.6%)	
TVD	17 (36.2%)	6 (11.3%)	
Total	47	53	

In our study, 47 out of 100 participants were having Diabetes Mellitus. Out of 47 diabetics, the most common angiographic pattern was Triple vessel disease (36.2%), then Double vessel disease(27.7%), followed by Single vessel disease (19.1). 12.8% diabetics had non-critical CAD while 4.3% had normal angiography.

Among non-diabetics, the most common finding was Single vessel disease=Double vessel disease (24.5% each) followed by Triple vessel disease. Diabetics are found to have multiple vessels involvement more often as compared to non-diabetic population. The p value is 0.013 which is statistically significant showing that the risk for CAD/ACS increases significantly with the presence of Diabetes Mellitus

Table 6: Association between CAD and Hypertension

Angiogram findings	**Hypertension**		**P Value**
	Yes N (%)	**No N (%)**	
Normal	1 (1.8%)	10 (23.3%)	0.001
Non-critical CAD	8 (14%)	11 (25.6%)	
SVD	12 (21.1%)	10 (23.3%)	
DVD	18 (31.6%)	7 (16.3%)	
TVD	18 (31.6%)	5 (11.6%)	
Total	**57**	43	

In our study, 57 out of 100 participants were having Hypertension. Out of 57 hypertensives, the most common angiogaphic pattern was Triple vessel disease=Double vessel disease(31.6% each), followed by Single vessel disease (21.1%). 14% hypertensives had non-critical CAD while 1.8% had normal angiography. Among non-hypertensives, the most common finding was non-critical CAD (25.6%) followed by Normal=Single vessel disease (23.3% each). Hypertensives are found to have multiple vessel involvements more often as

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compared to non-hypertensive population. The p value is 0.001 which is statistically significant showing that the risk for CAD/ACS increases significantly with the presence of Hypertension.

4. Discussion

In the study 57% patients had Hypertension. Gender wise distribution was 62.6% males & 29.41% females.
Out of 57 hypertensives, the most common angiographic pattern was Triple vessel disease=Double vessel disease (31.6% each), followed by Single vessel disease (21.1%). 14% hypertensives had non-critical CAD while 1.8% had normal angiography[6].
Among non-hypertensives, the most common finding was non-critical CAD (25.6%) followed by Normal=Single vessel disease (23.3% each).
Hypertensives are found to have multiple vessel involvements more often as compared to non-hypertensive population[7].
The proportion of hypertensive individuals was found to be maximum in TVD(78.2%), followed by DVD(72%), SVD(54.5%) and least in normal angiogram group(9.1%).The proportion of hypertensive population increases irrespective of the category whether CAD or normal as we move from lower age group 45-54 yrs(35.3%) to higher age group ≥65 Years (63.6%). The p value is 0.001 which is statistically significant showing that the risk for CAD/ACS increases significantly with the presence of Hypertension[8].
In the study 47 out of 100 patients had Diabetes Mellitus. Gender wise distribution was 41.1% females & 48.2% males.
These findings were similar to study by R. K. Galla, et al[9] 51.1% of study participants had Diabetes Mellitus.
Out of 47 diabetics, the most common angiographic pattern was Triple vessel disease (36.2%), then Double vessel disease(27.7%), followed by Single vessel disease (19.1). 12.8% diabetics had non-critical CAD while 4.3% had normal angiography.
Among non-diabetics, the most common finding was Single vessel disease,Double vessel disease (24.5% each) followed by Triple vessel disease.
Diabetics are found to have multiple vessels involvement more often as compared to non-diabetic population.
The proportion of diabetic individuals was found to be maximum in TVD (73.9%), followed by DVD (52%), SVD (40.9%) and least in normal angiogram group(18.18%)[10].
The proportion of diabetic population increases irrespective of the category whether CAD or normal as we move from lower age group 45-54 yrs (5.8%) to higher age group ≥65 Years (63.6%). The p value is 0.013 which is statistically significant showing that the risk for CAD/ACS increases significantly with the presence of Diabetes Mellitus.

5. Conclusion

Chest pain is the most common presenting symptom in patients of CAD which can be associated with diaphoreis, uneasiness etc but atypical site or character of pain should never be neglected specially if the patient is diabetic. Diabetes, Hypertension & dyslipidemia were the most prevalent modifiable risk factors while male gender & positive family history were non-modifiable risk factors associated with CAD.

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