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## An epidemiological study of coronary artery disease (CAD) at tertiary care hospital, Udaipur city, Rajasthan, India

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### Abstract

**Background:** Coronary artery disease (CAD) among CVDs is the largest killer in the developed world and is rapidly becoming one in the developing countries. CAD is a leading cause of mortality, morbidity and disability with high healthcare costs.

**Materials and Methods:** Cross sectional study was conducted to assess epidemiological factors of disease (CAD) in patients. First case was selected randomly then further every case was selected till 300 study subjects were covered.

**Results:** Mean age of the study Coronary artery subjects of coronary artery disease (CAD) was studied in the present study and found to be  $54.79 \pm 1.146$ . Majority of study subjects of coronary artery disease. 110 (36.67%) were current smokers. In the present study, study subjects of CAD were found to be decreasing with increasing level of education.

**Conclusions:** The findings of present study suggest that a number of modifiable risk factors and non modifiable risk factors are responsible for Coronary artery disease like age, past history of diseases, education level.

**Keywords:** Coronary heart disease, risk factors, hypertension, diabetes, waist hip ratio

### Introduction

The Indian subcontinent has the highest rates of CVDs globally, with an increased risk of developing CAD than European populations. Contrary to the epidemiologic transition, recent evidence indicates that South Asian individuals with a lower socioeconomic status (SES) are developing a higher disease burden of CAD than higher income individuals. Only about one-fourth of those who have CAD are aware of their disease and are seeking medical care<sup>[1]</sup>. Cardiovascular diseases (CVD) caused more than 2.5 million deaths in 2008. As per 2014 statistics by the World Health Organization, 26% of total mortality in India is contributed by CVD<sup>[2]</sup>.

Coronary artery disease (CAD) among CVDs is the largest killer in the developed world and is rapidly becoming one in the developing countries. CAD is a leading cause of mortality, morbidity and disability with high healthcare costs<sup>[3]</sup>. CAD is caused by atherosclerosis of the coronary arteries that leads to a restriction of blood flow to the heart<sup>[1]</sup>. Depending on the degree of stenosis (narrowing) and plaque characteristics, patients may experience stable angina (angina pectoris) or remain asymptomatic until a plaque ruptures and thrombosis occurs, causing acute Coronary syndrome<sup>[4]</sup>.

A recently published study (INTERHEART) of nearly 30 000 men and women from different communities and ethnic groups worldwide showed that such risk factors are common to all groups and can predict over 90% of the CHD risk. Lifestyle factors, including cigarette smoking, poor diet high in saturated fats and low in fruit and vegetables, physical inactivity, and stress have an important causal role in the incidence of CHD in all populations, while moderate alcohol consumption is protective<sup>[5]</sup>. Preventing coronary artery disease is largely about controlling the risk factors. Ideally, prevention habits start early, but they remain important all through life. It is never too late to effect change, though the earlier in life you do so, the greater the advantage<sup>[6]</sup>. With this in the background, a case-control study was conducted.

**Objective**

To assess epidemiological factors of Coronary artery disease (CAD) among the patients attending Geetanjali Medical College and Hospital (GMCH), Udaipur, Rajasthan, India.

**Materials and methods**

It was hospital based cross sectional study, conducted at cardiac care unit of Geetanjali Medical College & Hospital (GMCH), Udaipur, Rajasthan from July 2014 to June 2015. Study subjects consisted of old and newly diagnosed CAD cases attending GMCH. Information was collected on a pre-structured, well designed scheduled questionnaire. New and old cases of CAD attending GMCH were included in the study and patients who were unconscious and not giving consent were not included in the study. The subjects were explained with purpose of the study and assured for secrecy and confidentiality of the information which they provided us.

It was decided to include 300 study subjects in the study. First case was selected randomly then further every case was selected till 300 study subjects were covered. If any patient did not agree, then the next case was included in the study. After obtaining the written consent, the socio demographic data, personal habits including and history of past and family history of illnesses was also recorded. Physical measurements i.e. weight and height were recorded. Data was entered into Microsoft excel sheet and analyzed using Epi-info software. Descriptive statistics and inferential statistical tests were analyzed.

**Results**

Table no. 1 shows that out of 300 study subjects, Majority of the study subjects were 211 males (70.33%) than 89 were females (29.67%). Table no. 2 shows that, the mean age of the study subjects of coronary artery disease (CAD) was studied in the present study and found to be 54.79±1.146, when the data for male and female subjects pooled together. The gender influence when studied separately, it was observed that the mean age of the study subjects among females 55.21±1.008 was slightly higher than males 54.74±1.136.

Table no. 3 shows that age wise distribution of study subjects of coronary artery disease (CAD) was positively skewed inferring that the risk of CAD had increased with age. It is a progressive increase in the occurrence of CAD with age, with the peak 91 (30.33%) at 50 – 59 years followed by a slight decline 86 (28.67%) at 60 – 69 years & thereon. The youngest subject in this study was of 34 years of age and oldest was of 87 years of age. Table no. 4 shows that study subjects of coronary artery disease (CAD) in the present study, the highest percentage found was illiterate 83 (27.67%) followed by primary education 76 (25.33%), secondary education 60 (20.00%) and graduation 37 (12.33%). Only 32 (10.67%) of the CAD subjects had post graduate education while only 12 (4.00%) had professional degrees.

Table no. 5 shows that there were overall 132 (43.00% - row 1 + 3) subjects of CAD had hypertension and out of which there were 35 (16.59%) males and 27 (30.34%) females, who had only hypertension whereas 98 (32.67% - row 2 + 3) subjects had diabetes out of them 19 (9.04%) males and 09 (10.11%) females were only diabetics. 70 (23.33%) patients, who had both the co – morbid disease (HTN + DM) of which 48 (22.75%) were males and 22 (25.84%)

were females. On the other side 138 (46.00%) patients had no history of co - morbid disease. Table no. 6 shows that majority of study subjects of coronary artery disease. 110 (36.67%) were current smokers followed by 51 (17.00%) Ex smokers and 139 (46.33%). Majority of smokers and Ex smoker were males as compared to females.

**Table 1:** Gender wise distribution of the study subjects.

S. No.	Gender	No.	Percentage
1.	Male	211	70.33
2.	Female	89	29.67

**Table 2:** Mean age of the study subjects

S. No.	Gender	Mean Age ± SD
1	Male	54.74 ± 1.136
2	Female	55.21 ± 1.008
Total		54.79 ± 1.146

**Table 3:** Distribution of the study subjects according to Gender and Age.

Age group	Male		Female		Total	
	N	%	N	%	N	%
< 40	13	6.16	1	1.12	14	4.66
40 – 49	46	20.85	9	10.11	55	17.67
50 – 59	62	29.38	29	32.58	91	30.33
60 – 69	58	27.48	26	31.46	84	28.67
>70	32	15.17	24	29.97	56	18.67
Total	211	100	89	100	300	100
$\chi^2 = 13.016$			P value = 0.01			

**Table 4:** Distribution of the study subjects according to Educational status.

Education status	Male		Female		Total	
	N	%	N	%	N	%
Illiterate	49	23.22	34	38.20	83	27.67
Primary	54	25.59	22	24.72	76	25.33
Secondary	42	19.91	18	20.22	60	20.00
Graduate	32	15.17	5	5.62	37	12.33
Post Graduate	24	11.37	8	8.99	32	10.67
Professional	10	4.74	2	2.25	12	4.00
Total	211	100	89	100	300	100
$\chi^2 = 11.031$			P value = 0.05			

**Table 5:** Distribution of the study subjects according to Gender and their Past H/o of HTN, DM

Past history	Male		Female		Total	
	N	%	N	%	N	%
Only HTN	35	16.59	27	30.34	62	20.67
Only DM	19	9.04	9	10.11	28	9.33
HTN + DM	48	22.75	24	25.84	70	23.33
No H/o HTN / DM	109	51.66	29	32.58	138	46.00
Total	211	100	89	100	300	100
$\chi^2 = 11.223$			P value = 0.01			

**Table 6:** Distribution of the study subjects according to Gender and Smoking Tobacco.

Status of the Smoking	Male		Female		Total	
	N	%	N	%	N	%
Current	108	51.20	2	2.24	110	36.67
Ex – Smoker	50	23.70	1	1.12	51	17.00
Non - Smoker	53	24.17	86	96.64	139	46.33
Total	211	100	89	100	300	100
$\chi^2 = 128.73$			P value = 0.00001			

## Discussion

The present hospital based cross sectional was carried out to assess epidemiological factors of CAD. In the present study more male study subjects as compare to female study subjects. Similar findings were reported by Mohanan *et al.* [7].

In the present study mean age of study subject of coronary artery disease (CAD) was  $54.79 \pm 1.146$  and mean age of females was more as compared to female. Similar observations was observed study by Joshi *et al.* In South Asians, the mean age of first acute myocardial infarction for male was  $53.0 \pm 11.40$  years [8], whereas the same in female was  $58.60 \pm 11.60$  years. It is pertinent to note that Praveen *et al.* Also reported that acute coronary syndrome occurred at mean age of  $56.60 \pm 12$  years in men and  $61.8 \pm 10.0$  years in women [9]. In a study by Quereshi *et al.* done at Lahore, the mean age observed was  $49.72 \pm 0.524$  years in men and  $49.52 \pm 0.963$  years in women [10]. The mean age in the women with CAD was higher than the men that show increasing chance of CAD in women after menopause and it may be related to change of lipid profile.

In the present study majority of study subjects of coronary artery disease (CAD) 30.33% were 50 - 59 years followed by a slight decline at 60 - 69 years & thereon. Similar observations observed study done in Iran by Zahra *et al.* in which there was majority study subjects observed in the age group of 51 - 60 years [3]. The results were also comparable to a study by Gurung Ram Bahadur *et al.* at Dhulikhel, Nepal, he also observed the maximum number of CAD patients in 5<sup>th</sup> decade [11] while in a study done by Satish L at Bellur (Karnataka) there were maximum number of CAD patients in 6<sup>th</sup> decade [12].

In the present study, study subjects of CAD were found to be decreasing with increasing level of education. Similar findings were reported by Albert *et al.* in a prospective analysis they observed a decrease in incident CAD events with increasing levels of education [13]. In another case control study done by Rachna Kapur *et al.* at Ahmadabad, same results were found that 24% were Illiterate, 24% were educated up to Primary level, 30% up to Secondary level and 20% were Graduate [14]. It may be due to high educated person have more knowledge of diseases so they have positive attitude towards healthy life style.

In the present study 53.33% of study subjects of CAD had past history of hypertension, diabetes mellitus or both. In statistical analysis, it is to be said that there is significant difference in association between male and female with past history of hypertension & Diabetes Mellitus. These results were also supported with a study done by Zahra *et al.* in Iran i.e. 43.7% had hypertension and 32.5% had Diabetes Mellitus [3]. In a study at Kerala done by James C observed 39% subjects had Hypertension and 58% had Diabetes [15]. In another study done by Jafary MH *et al.* observed that 55.2% subjects had Hypertension and 37.8% subjects had Diabetes [16]. As we all know that Diabetes Mellitus and Hypertension plays an important contributory role in Ischemic Heart Disease occurrence in both the physiological and genetically pathway. People with high blood pressure are more likely to develop coronary artery disease because high blood pressure puts added force against the artery walls. Over time, this extra pressure can damage the arteries. These injured arteries are more likely to become narrowed and hardened by fatty deposits. Diabetes Mellitus increases the risk for MI attack incidence and mortality.

In the present study, it was observed that majority of males 108 (51.20%) were current smokers followed by ex and Non - smokers approximately similar in numbers for the males. Among males current and Exsmokers formed 75% of the study subjects, which shows significant relation with CAD. Smoking among females was noted as uncommon. Among female smokers formed nearly 3.00% of the study subjects, which failed to show any significant relation with CAD. Similar findings were reported by for males and females study done by Achan and Thakur [17].

## Conclusion

Coronary artery disease is the leading cause of death in India and worldwide. The findings of present study suggest that a number of modifiable risk factors and non modifiable risk factors are responsible for Coronary artery disease like age, past history of diseases, education level. Modifiable risk factors preventable so effective health education and health promotion measures should at community level and school health programme.

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