

# A HOSPITAL BASED STUDY ON FREQUENCY OF RISK FACTORS OF CORONARY ARTERY DISEASE IN PESHAWAR

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## ABSTRACT

**Objective:** To find out the frequency of risk factors of coronary artery disease (CAD) in a tertiary care hospital in Peshawar.

**Material and Methods:** In this prospective observational study, patients admitted to cardiology department of Lady reading hospital Peshawar with established diagnosis of coronary artery disease were included from July 2004 to June 2005. Patients were interviewed according to a pre-designed questionnaire. The laboratory reports regarding random and fasting blood sugar, blood pressure, cholesterol and triglyceride levels were recorded from the chart of the patients. Patients with risk factors but with no preceding coronary artery disease were excluded from the study.

**Results:** A total of 813 patients of CAD were included and a total of 1101 risk factors were recorded on the whole. Out of 813 patients, 454(55.84%) were females and 359(44.16%) were males. Age range was from 20 to 95 years with mean age of 57.5 years. Out of total, 35.42%(n=288) had more than one risk factors. Risk factors distribution was: hypertension 59.16%, diabetes 32.59%, hyperlipidemia 16.48% chronic smokers 14.02%, obesity 6.51%, coagulative disorders 1.10% and history of oral contraceptive use 0.86%. Hypertension (59.25%) and hyperlipidemia (53.58%) were more common in females. Hypertension (37.47%) and smoking (51.75%) were common in lower social class people while diabetes (44.9%) and hyperlipidemia (38.05%) in upper class people.

**Conclusions:** Hypertension, diabetes, hyperlipidemia and smoking are major modifiable risk factors of coronary artery disease in patients presenting with CAD to a tertiary care hospital in Peshawar.

**Key words:** Risk Factors, Coronary Artery Disease, Peshawar.

## INTRODUCTION

During the year 2000, more than half of the world deaths were due to coronary artery disease (CAD) in the developing countries.<sup>1</sup> Coronary artery disease are major and growing contributors to morbidity, mortality and disability in the South Asian countries including Pakistan.<sup>2</sup> The total mortality due to cardiovascular disease in Pakistan during 2002 estimated by WHO was 154338.<sup>3</sup>

Hypertension is a well-established predisposing factor for cardiovascular diseases such as coronary artery disease (CAD), atherosclerosis, left ventricular hypertrophy (LVH), and left ventricular failure (LVF) that have high mortality rates.<sup>4</sup>

Diabetes is a risk factor for coronary artery disease and stroke and is more prevalent in the developed countries<sup>5</sup>. World health organization

(WHO) gives prevalence of diabetes in people aged 27 years or above as 5-9.9% in India and Pakistan, 15% in Qatar, 10-14.9% in Greece, and below 5% in China and Kenya<sup>5</sup>.

A high level of low density lipoprotein (LDL)- cholesterol leads to coronary artery disease, and stroke while high density lipoprotein (HDL) reduces the risk of myocardial infarction and stroke<sup>6</sup>. In Pakistan, according to WHO report, the average cholesterol level in women aged 30 and above is 120-182 mg/dl, while it is 220-239.6mg/dl in China and 200-239.6 mg/dl in India and 240mg/dl or above in Serbia<sup>3</sup>.

Smoking causes one fifth of coronary artery diseases worldwide. In Pakistan according to WHO report, percentage of people aged 18 year and above who smoke is 3.8% for female, 15-30% for males; while for male it is 60% or above in Kenya and Yemen and 50% or above in Russia and

30% or above in Sudan <sup>7</sup>. Obesity is predisposing risk factor to coronary artery disease, hypertension, diabetes and malignancies<sup>8</sup>.

The objective of this study was to determine the frequency of risk factors in patients of coronary artery disease hospitalized in Lady Reading hospital Peshawar.

**MATERIAL AND METHODS**

This prospective observational study was conducted in cardiology department, Postgraduate Medical Institute, Government Lady Reading Hospital Peshawar, from July-2004 to June 2005. A total of 813 patients, 454 (58.84%) females and 359 (44.16%) males, with age ranging from 20 to 95 years with mean age of 57.7 years were included.

Inclusion criteria were all the patients, irrespective of age and sex, with established diagnosis of coronary artery disease. Exclusion criteria were all patient with diseases like hypertension, diabetes, hyperlipidemia, obesity and chronic smokers who had not yet developed coronary artery disease.

Hypertension was defined as systolic blood pressure more than 140 mm Hg and diastolic blood pressure more than 95mm Hg on more than one occasion. Patients were diagnosed as diabetic if fasting plasma glucose level was more than 130 mg/dl on more than one occasion. In this study patients were labeled as hyperlipidemic if total serum cholesterol level was 200mg/dl or higher.

A questionnaire was designed in accordance with the objectives of the study. A detailed history of patients was taken and general physical examination was carried out. History of hypertension, diabetes, smoking, hyperlipidemia alcoholism and use of oral contraceptives was taken from patients.

Family history and duration of major risk factors was recorded. Blood pressure of every patient was recorded. Fasting blood sugar, random blood sugar; serum cholesterol level, and

triglyceride levels were also recorded. Finally statistical analysis of the results was carried out and association of risk factors with CAD was studied.

**RESULTS**

A total of 813 patients were selected and 1101 risk factors were recorded. Two hundred and eighty eight (35.42%) patients had more than one risk factors. Out of 813 patients, 454 (55.84%) were females and 359(44.15%) were males. Risk factors distribution was: hypertension (59.16%), diabetes (32.59%), hyperlipidemia (16.48%), smoking (14.02%) followed by a list of minor risk factors (Table No-I).

**FREQUENCY OF RISK FACTORS IN PATIENTS WITH CORONARY ARTERY DISEASE**

(Total No of Patients = 813;  
Total No of Risk factors = 1101)

Risk Factors of Coronary Artery Diseases	Frequency ( n = 813 )	%age
Hypertension	481	59.16
Diabetes	265	32.59
Hyperlipidemia	134	16.48
Smoking	114	14.02
Obesity	53	6.51
Coagulative disorders	9	1.10
Oral contraceptives	7	0.86
No risk factor seen	38	4.67
More than one risk factors	288	35.42

Table 1

The age range of patients was from 20 to 94 years with mean age of 57.5years. Hypertension was common in all age ranges but more common in age range 40-60 years. Diabetes was more common in age range 40 to 60 years. Hyperlipidemia and smoking were more common in age range 25 to 40 years (Table No-2).

Hypertension, diabetes and hyperlipidemia were more common in females, their distribution

**AGE VERSUS RISK FACTORS IN CORONARY ARTERY DISEASE**

AGE RANGE	Hypertension n=481		Hyperlipidemia n=134		Diabetes mellitus n=265		Smoking n=114	
	N	%	N	%	N	%	N	%
20-40 years Total patients = 180	92	51.1	31	17.2	29	16.1	28	15.6
41-60 years Total patients = 529	249	47.1	76	14.4	158	29.7	46	6.7
More other 60 years Total patients=285	140	49.1	27	9.5	78	27.4	40	14.0

Table 2

GENDER VERSES RISK FACTORS IN CORONARY ARTERY DISEASE

Sex	Hypertension n=481		Hyperlipidemia n = 134		Diabetes n = 265		Smoking 114	
	N =	%age	N =	%age	N =	%age	N =	%age
Male	196	40.8	53	31.8	123	46.4	114	100
Female	285	59.2	81	58.2	142	53.6	0	0.00

Table 3

DURATION OF RISK FACTORS IN CORONARY ARTERY DISEASE

Duration of Risk Factors	Hypertension = 481	Diabetes = 265	Smoking =114
Less than 5 years	97(20.16%)	45(16.98%)	24(20.05%)
6-10 years	169(35.13%)	83(31.32%)	36(31.57%)
>10 years	215(44.98%)	137(51.69%)	54(47.36%)

Table 4

in females was: hypertension (59.25%), diabetes (58.19%) and hyperlipidemia (53.58%). We found that all smokers were male patients (Table No-3).

The patients reporting to our study had variable duration of the risk factors of CAD, ranging from newly diagnosed up to 25 years of the disease. Most of our patients had the disease for more than ten years with a distribution of the corresponding risk factors as; hypertension in 44.98%, diabetes in 51.69% and chronic smoking in 47.36% cases (Table No-4)

We observed that hypertension (53.25%) and smoking (17.45%) were more common in lower social class people. Diabetes (34.39%) was common in upper social class people and hyperlipidemia (17.08%) in middle social class people (Table No-5).

The respondents had coexistence of hypertension and diabetes in families (29.67%) followed by hypertension (27.83%) and diabetes (23.80%). Out of total, 16.11% patients had family history of CAD (Table No-6).

Coexistence of hypertension and diabetes was recorded in 7.53% of angina and 15.54% of myocardial infarction (MI). Coexistence of

hypertension and smoking was recorded in 5.60% of angina and 7.53% of MI. Cases where obesity was labeled as risk factor of CAD were 11(5 angina and 6 MI) however its coexistence with hypertension was present in 22 cases (2.70%) [Table No-7].

DISCUSSION

Cardiovascular disease profile in Pakistan and other countries of South Asia shows the presence of emerging and advancing diseases such as coronary artery diseases (CAD) and cerebrovascular accidents (CVA) and of established and receding diseases such as hypertension and diabetes, which are also risk factors for CAD and CVA<sup>9</sup>. In this study presentation of coronary artery disease was common than other heart diseases and our findings correlates with World Health Organization report 2003 on cardiovascular disease<sup>10</sup>.

A total of 43.68% of coronary artery disease is due to high blood pressure. In Pakistan the average systolic BP of people aged 30 years and above is 130-140mmHg, while it is 120-130 mm Hg in India, above 140mmHg in Senegal and 120mm Hg in Thailand<sup>3</sup>. Females are more

SOCIOECONOMIC DISTRIBUTION TO CORONARY ARTERY DISEASE

Socioeconomic status	Hypertension n = 481		Diabetes n = 265		Hyperlipidemia n = 134		Smoking n = 114	
	N	%	N	%	N	%	N	%
Lower class up to Rs. 5000/month Total patient=338	180	53.25%	71	21.00	28	8.28	59	17.45
Middle-Class Rs. 10,000-20000/month Total patient = 322	185	48.13	85	26.39	55	17.08	27	8.38
Upper class Rs. >2,0000/month Total patients = 344	146	47.44	119	34.59	51	14.82	28	8.13

Table 5

**FAMILY HISTORY OF RISK FACTORS AND CORONARY ARTERY DISEASE**

Total No of Patients =137

Risk Factors	No.	%
Hypertension	76	27.83
Diabetes	65	23.80
Hypertension + Diabetes	81	29.67
CAD	44	16.11
Hyperlipidemia	7	2.56

Table 6

hypertensive than males usually in age above 40 years, and our findings are similar to study done in between 1942-1997 in men and women of 40-49 years in urban setup<sup>11</sup>. In present study 157(57.50%) cases had family history of hypertension, a study shows that when both parents are hypertensive there are 46% chances for offspring's to develop hypertension<sup>12</sup>. However, the risk of coronary artery disease decreases with effective treatment of hypertension<sup>13</sup>. Treatment ratio is very low in our patients furthermore in a study from UK, only 16-20% hypertensive patients' were taking antihypertensive drugs<sup>14</sup>.

Diabetes is the second most common risk factor (23.00%) of coronary artery disease in present study. Diabetes also affects maximum number of people in age category of 41-60 years in our community while South Asia also has 0.67 to 5% of diabetic cases with a peak age of 50-60 years<sup>15</sup>. Diabetes also strongly exists in families like hypertension; therefore it is said that two diabetics should not marry each other because theoretically if they had a hundred children, all will develop diabetes<sup>16</sup>. Hyperlipidemia stands third important risk factor of coronary artery diseases. Hyperlipidemia can cause blockage of coronary arteries and increase incidence of ischemic heart disease<sup>8</sup>. The recommended levels in United State for total cholesterol in adult aged population is less than 240mg/dl, for LDL cholesterol less than 160mg/dl, for HDL cholesterol less than 40mg/dl, and for triglycerides (fasting) is less than 200mg/dl<sup>17</sup>.

Smoking scores 114 (9.89%) of the Total risk factors to coronary artery disease in our patients. It is more common in poor and illiterate people, similar results were seen in a study done in South Africa.<sup>18</sup> We observed 100% male smoker with no female smoker in our study. Obesity is a moderate risk factor in our patients. In Pakistan average Body Mass Index (BMI) of people aged 15 and above is estimated to be 23-24.9kg/m<sup>2</sup> for females and 18-22.9 for males, in India 23.24 for female and 18-22.9 for males, in Brazil 25 26.9

**RISK FACTORS OF CORONARY ARTERY DISEASE AND THEIR COEXISTENCE**

(n = 813)

Risk Factors of CAD	Number of Patients	% of Total
Hypertension only	273	33.657%
Diabetes only	102	12.54%
Hypertension + Hyperlipidemia	29	3.56%
Hypertension + Diabetes	94	11.56%
Diabetes + Hyperlipidemia	29	3.56%
Diabetes + Hyperlipidemia + Hypertension	10	1.23%
Hypertension +Smoking	53	6.51%
Smoking only	40	4.92%
Diabetes + Smoking	21	2.58%
Obesity only	11	1.35%
Obesity + Hypertension	22	2.70%
Obesity + Diabetes	9	1.10%
Obesity + Hyperlipidemia	11	1.35%
Oral contraceptives	7	0.86%
Coagulative disorders	9	1.10%
No risk factor seen	38	4.62%

Table 7

female and 23-24.9 males and in USA and Canada it is above 27 for both females and males.<sup>19</sup> BMI over 25 is considered as over weight however some exceptions are there where a BMI over 30 kg/m<sup>2</sup> is considered as obese so one value does not fit for all.<sup>20</sup> South Asians including our country has a rapid increase of aged people, changes in life style, decrease physical activity, which leads to obesity, which then leads to multiple problems<sup>9</sup>.

Coronary artery diseases can be controlled with effective treatment of hypertension and diabetes. If we can control risk factors then it is easy to avoid developing coronary artery disease. Therefore it is suggested that preventive measures should be adopted. Prevention of coronary artery diseases has to be integrated in primary healthcare. Preventive approaches have greater importance as secondary and tertiary treatment costs are not affordable to all people of community. Our prime targets are poor diet, physical inactivity and smoking which should be prevented by treatment of the symptomatic patients and asymptomatic patients, along with screening for high blood pressure, diabetes and hyperlipidemia.<sup>21</sup> Obesity is often mistaken for prosperity and health, hence public education to address such misconceptions and to promote healthy behaviors, is essential and should be directed both at the individual and community levels, and should be started from child-hood.<sup>22</sup> Globalization of production and marketing of tobacco requires robust response, that

is improving research and monitoring of risk factors plus evaluation of health system must be provided with high priority. We need research on every aspects of cardiovascular diseases but it has been observed that research in these sectors in not satisfactory and in our country only twelve research publications on cardiovascular diseases were seen in 1999-2001 while it is 12502 in USA, 2667 in UK, and 294 in India.<sup>3</sup>

## CONCLUSION

Hypertension, diabetes and smoking are major modifiable risk factors of coronary artery disease. Obesity coagulative disorders and history of use of oral contraceptives are minor risk factors to coronary artery disease.

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