

# PREVALENCE OF CAD IN FEMALES WITH HYPERTENSION AND DIABETES MELLITUS PRESENTING WITH CHEST

ASIM JAVED\*, SOHAIL AZIZ, AFSAR RAZA

## SUMMARY

**Objective:** To analyze the prevalence of coronary artery disease (CAD) in hypertensive and diabetic Pakistani female population admitted to cardiac ward in a tertiary care cardiac hospital (AFIC-NIHD) Rawalpindi) with chest pain suspected of cardiac origin.

**Design:** Prospective observational study.

**Place of study:** Armed Forces Institute of Cardiology-NIHD Rawalpindi, Pakistan.

**Patients and methods:** We studied 100 consecutive female patients admitted from Jan 2005 onwards, to cardiac female ward of AFIC with chest pain suspected of cardiac origin and then undergoing diagnostic coronary angiography. The patient population included cases admitted directly from emergency reception, from OPD and those admitted to CCU but kept in ward due to non availability of beds in CCU. We recorded the ages, blood pressures, blood sugar levels and angiographic findings.

## Results:

100 female patients were studied with a mean age of 56 years (range 33-76 years). Out of these 100 patients, 8 (8%) had only diabetes mellitus, 39 (39%) had only hypertension and 27(27%) patients had combined diabetes mellitus and hypertension while 26 patients (26%) did not have any of these risk factors. Coronary angiogram revealed that 28% patients had normal coronary arteries while 72 % had coronary artery disease (CAD). In our study out of 72 patients who had angiographically proven CAD 4 pt's (5.5%) were between 30 and 40 year of age, 11 (15%) between 41 and 50 years, 25(35%) between 51 and 60 years, 24(33%) between 61 and 70 years and another 8 pt's (1.1 %) were over 70 years of age. All 8 diabetics (100%) had CAD while 26 out of 39 hypertensives (67%) had CAD. Out of 27 patients who had both DM and HTN, 23 (85%) had angiographically proven CAD. Out of 26 patients who neither had DM nor HTN, 15 (58%) still had CAD.

## Conclusion:

We conclude that increasing age along with hypertension and diabetes mellitus are the most significant risk factors for CAD in Pakistani females.

**KEY WORDS** CAD, Females, DM, HTN

## INTRODUCTION

Coronary artery disease (CAD) is the leading cause of death in men and women worldwide and accounts for about a third of all deaths in women in western world [1]. Many women have breast cancer as their biggest

fear, not knowing that coronary heart disease is their main killer. Women are generally considered less vulnerable to CAD because of the protection by sex hormones [1] [2]. Various studies have been carried out in the west regarding the risk factors of CAD in women but no significant data is available in the Pakistani population. This study was therefore conducted to evaluate the role of hypertension and diabetes mellitus on extent of CAD in Pakistani women.

\* Corresponding Author:-

AFIC / National Institute of Heart Diseases, The Mall, Rawalpindi, 21-Valley Road, St. 3, Rawalpindi.

**PATIENTS AND METHODS**

We studied 100 consecutive female patients admitted from Jan 2005 onwards, to cardiac female ward of AFIC with chest pain suspected of cardiac origin and then undergoing diagnostic coronary angiography. The patient population included cases admitted directly from emergency reception, from OPD and those admitted to CCU but kept in ward due to non availability of beds in CCU. We recorded the ages, blood pressures, blood sugar levels and angiographic findings. JNC V 11 criteria for hypertension was considered to make a diagnosis of hypertension. A diagnosis of diabetes mellitus was accepted according to the criteria given by WHO.

**RESULTS**

100 female patients were studied with a mean age of 56 years (range 33-76 years). Out of these 100 patients, 8 (8%) had only diabetes mellitus, 39 (39%) had only hypertension and 27(27%) patients had combined diabetes mellitus and hypertension while 26 patients (26%) did not have any of these risk factors. Coronary angiogram revealed that 28% patients had normal coronary arteries while 72 % had coronary artery disease (CAD). In our study out of 72 patients who had angiographically proven CAD 4 pt's (5.5%) were between 30 and 40 year of age, 11 (15%) between 41 and 50 years, 25(35%) between 51 and 60 years, 24(33%) between 61 and 70 years and another 8 pt's (11 %) were over 70 years of age. All 8 diabetics (100%) had CAD while 26 out of 39

hypertensives (67%) had CAD. Out of 27 patients who had both DM and HTN, 23 (85%) had angiographically proven CAD. Out of 26 patients who neither had DM nor HTN, 15 (58%) still had CAD.

**Table 2 :**

Coronary Angio	HTN n=39	DM n=8	Combine HTN & DM n=27	Neither HTN nor DM n=26	Total
Normal	13	0	4	11	28
LMS	0	0	2	1	3
TVCAD	12	3	11	5	31
DVCAD	5	3	4	5	17
SVCAD	7	2	3	3	is
Minor CAD	2	0	3	1	6
Total CAD	26(67%)	8(100%)	23(85%)	15(58%)	

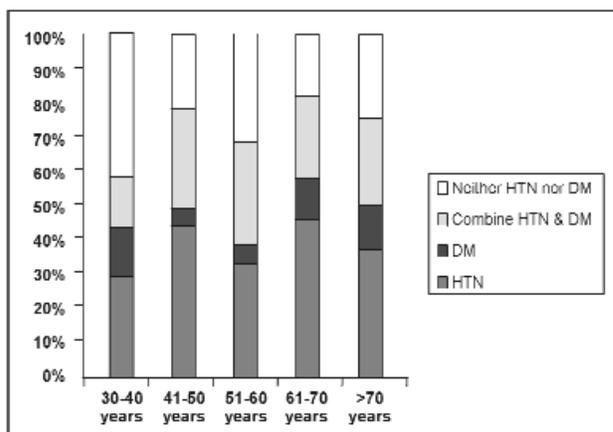
**Table 3 :**

Risk factors	30-40 years	41-50 years	51-60 years	61-70 years	>70 years	Total
HTN	2	10	11	13	3	39
DM	1	1	2	3	1	8
Combine HTN & DM	1	7	10	7	2	27
Neither HTN nor DM	3	5	11	5	2	26
Total	7	23	34	28	8	100

**Table 1 :**

Coronary Angio	30-40 years n=7	41-50 years n=23	51-60 years n=34	61-70 years n=28	>70 years n=8	Total
Normal	3	12	9	4	0	28
LMS	0	0	1	2	0	3
TVCAD	1	5	7	15	3	31
DVCAD	0	3	6	5	3	17
SVCAD	2	2	8	1	2	15
Minor CAD	1	1	3	1	0	6
Total CAD	4(57%)	11(48%)	25(74%)	24(86%)	8(100%)	

**Graph-1**



## DISCUSSION

The incidence of CAD is 2 to 3 fold greater in men than in women[1]. Awareness of epidemiological and clinical aspects of CAD in women has increased recently[3-5]. Substantial data are not available on angiographically proven CAD in women from Pakistan. This study aims at providing a baseline information for future prospective studies.

Many women are unaware that coronary heart disease is their main killer; their biggest fear is breast cancer. Even more worrying, however, is the apparent lack of awareness of cardiovascular disease in women among healthcare professionals. At the time of presentation with heart disease, women tend to be 10 years older than men, and at the time of their first myocardial infarction they are usually 20 years older[6-7]. As coronary heart disease is a disease of the older woman, many women believe that they can postpone attempts to reduce their risk. Table-1 shows the increasing incidence of CAD with increasing age (rising from 48% in younger age group to 100% in women over 70 years of age). Table-1 also shows the dominance of multiple vessel disease in elderly age group as compared to normal or single vessel disease in younger women which is in conformity with other studies according to which younger patients have a higher incidence of normal coronary arteries, mild luminal irregularities, and single vessel coronary artery disease than do older patients [8]. The pattern of coronary involvement in this study shows the highest prevalence of triple vessel CAD which is also supported by our neighboring Indian studies [9-10]. Another similar study was conducted in AFIC-NIHD Rawalpindi which was published in 1999 [11]. The study included 163 women, with chest pain suspected of cardiac origin and then undergoing coronary angiography. The mean age in that study was 53 years (range 32-75 years) and the mean age in our study was 56 years (range 33-76 years). In 1999, 35.6% females were found to have normal coronaries and 64.4% had coronary artery disease. Our study shows slight rise in the incidence of CAD in females as only 28% had normal coronaries and 72% had CAD.

Hypertension is associated with a twofold to threefold increased risk of coronary events in women[6] [12]. Diabetes mellitus negates a woman's pre-menopausal protection against CAD [13]. Diabetes mellitus is a

stronger prognostic factor after myocardial infarction in women than in men [9]. women with diabetes have 2.6 times the risk of dying from coronary heart disease than women without diabetes compared with a 1.8-fold risk among men with diabetes [6]. It appears that the protective mechanism against CAD existing in premenopausal women may be inoperative in presence of DM. Although the exact reasons for this is not known, factors like altered platelet function, decreased fibrinolytic activity and high association of lipid abnormalities in diabetes are put forward to explain the excessive risk of CAD[14].

In our study also hypertension and diabetes were significantly associated with CAD. Table-2 reveals that 67% hypertensives, 100% diabetics and 85% females with combined HTN and DM had CAD. Out of 72 angiographically proven CAD pt's, 57 (79%) had underlying hypertension or diabetes mellitus as risk factor. Our study is in conformity with Framingham multivariate model data, which suggested that diabetes mellitus was an independent risk factor in women[15]. Diabetes was considered a CAD equivalent for both men and women in the 2002 National Cholesterol Education Program report, thereby elevating it to the highest risk category [16]. The most compelling evidence for the importance of hypertension in diabetes comes from the United Kingdom Prospective Diabetes Study (UKPDS) [17]. At nine year follow-up it was noted that each 10 mmHg reduction in updated mean systolic pressure was associated with a 12 percent risk reduction in any complication related to diabetes. (including cardiovascular disease); the lowest risk occurred at a systolic pressure below 120 mmHg. Based upon this and other observations, aggressive antihypertensive therapy has been warranted in all patients with diabetes and the recommended goal blood pressure is less than 130/80 mmHg[18].

## SUMMARY

Our study has highlighted that increasing age along with hypertension and diabetes mellitus are the most significant risk factors for CAD in Pakistani females. The data clearly shows the high incidence of CAD in Pakistani female population necessitating aggressive management of hypertension and diabetes mellitus to control the epidemic of CAD in south east Asia.

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