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PREVALENCE OF ASYMPTOMATIC CORONARY ARTERY DISEASE IN PATIENTS OF TYPE II DIABETES MELLIT

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Asbtract:

Objective: *To select a subgroup of type 2 diabetics having Coronary artery disease with two predetermined risk factors to see if there is any benefit in detecting these patients.*

Study Design: *A Retrospective Study.*

Place and Duration: *In the Cardiology Department of Nishtar Hospital, Multan for two year duration from March 2015 to March 2017.*

Methods: *526 patients were selected for thallium screening or treadmill stress testing. Abnormal outcome was recommended by coronary angiography. CAD proves after angiographically correlated with several risk factors to know the association between variables and disease.*

Results: *235 (48%) patients had deranged findings and 158 (67%) of them were performed with coronary angiography. CAD was confirmed in 20%. In 35 (33%) patients Coronary artery bypass grafting (CABG) was done, and in 30 (27%) catheter-based intervention (PCI) was performed and patients were not eligible for intervention in 44 (40%) patients. Smoking, Diabetes, albuminuria, diabetic retinopathy and duration of peripheral vascular disease were important predictors of asymptomatic CAD.*

Conclusion: *This study showed that there is a strong association between asymptomatic CAD and risk factors in type 2 diabetics.*

Key words: *Asymptomatic, Coronary artery disease, diabetes mellitus.*

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INTRODUCTION:

In diabetics, Coronary artery disease is the major cause of mortality and morbidity. Most of the diabetics die due to coronary artery disease. In diabetic patients Myocardial infarction leads to a more severe prognosis. In diabetic patients after ST elevation due to myocardial infarction is severe diarrhea as compared to unstable angina or myocardial ST elevation. Diabetic patients undergoing re-vascularization are most at risk and poor overall pain survival. Chest pains However, many patients with severe obstructive coronary artery disease have no symptoms of shortness of angina and can present with shortness of breath, and have fatigue. The asymptomatic structure of the disease delays treatment and diagnosis. While asymptomatic CAD frequency is commonly found in the literature from 8% to 76% based on available records on CAD asymptomatic, the risk of future cardiac death also led the doctor to adopt a method to elicit the possible causes of ill patients with diabetes without CAD is similar to a non-diabetic patient. The American Diabetes Association recommended the identification of coronary artery disease in diabetes mellitus patients who are asymptomatic and with two or more additional risk factors. Similarly, for diabetic patients over sixty years European guidelines recommend screening with a DM greater than 10 duration and related with atherosclerotic risk factors. This study was performed to diagnose asymptomatic coronary artery disease in diabetic patients with hypertension and dyslipidemia.

MATERIALS AND METHODS:

This Retrospective Study was held in the Cardiology Department of Nishtar Hospital, Multan for two year duration from March 2015 to March 2017 Patients with diabetes mellitus type II for more than five years and age 40 to 70 with at least two additional risk factors, ie dyslipidemia and hypertension were included. Patients with previous infarct evidence of angina and myocardial infarction were not taken on the basis of rose question, angina pectoris; previous revascularization procedures (CABG PCI), history of COPD history, symptoms suggestive of asthma, chronic use of unstable bronchial, dipyridamole or aminophylline were not selected. In most patients (18%) of the disease asymptomatic coronary artery disease screening method was tested for patient and computed tomography single-photon emission (SPECT) exercise / drug treadmill exercise (82%). Coronary angiography recommended positive stress test or perfusion defect in nuclear studies. All patients have blood sugar fastening, lipid profile two hours of prandial blood glucose urea, HbA1C, electrolytes, creatinine, resting ECG, microalbuminuria, chest x-ray and resting echocardiogram. By Sokolow criteria, Left ventricular hypertrophy was evaluated and echocardiography in ECG. Using Bruce's standard protocol the stress test on the treadmill was done. Images of the thallium 201 SPECT or Technetium 99m-sestamibi were obtained according to the American nuclear cardiology community recommendations. Using 180-degree SPECT study was done using elliptical or circular acquisition for 64 projections at 20 s per projection. The interpretation of the image was based on semi-quantitative and visual interpretation using the 21-segment module for each stress and resting image. According to the standard protocol, CAD was diagnosed by coronary angiography. Less than 0.05 P value showed statistical importance. The step-by-step logistic regression analysis was performed using the LR program of the BMDP statistical package 2007, and the full p-values of the test were calculated using Stats Direct Statistics Software Version 2.0.

RESULTS:

The study was approved by local ethical committee. 1,200 total patients were examined during two years analysis, of which 526 were selected for further evaluation. 36 (6.79%) patients rejected further investigations. 490 (92.92%) patients agreed to perform noninvasive tests.

Table-I: Descriptive statistics for various variables

Variable	*Frequency (n=490) No.(%)*	*Variable*	*Frequency (n=490) No.(%)*
Male	191 (39.0)	Urea (mmol/l)<6.0	304 (62.4)
Female	299 (61.0)	Urea (mmol/l) >6.0	183 (37.6)
Age (years) <50	70 (14.3)	Creatinine (µmol/l)<80	231 (47.4)
Age (years) >50	420 (85.7)	Creatinine (µmol/l) >80	256 (52.6)
BMI Normal (<25.0)	38 (7.8)	(Na+) (mmol/l)<136	72 (14.9)
Overweight (25-29.9)	150 (30.6)	(Na+) (mmol/l) 136-142	394 (81.4)
Obese (>30.0)	302 (61.6)	(Na+) (mmol/l)>142	18 (3.7)
SYS.BP. <130 mmHg	64 (13.1)	Potassium (mmol/l)<3.5	14 (2.9)
SYS.BP. >130 mmHg	426 (86.9)	3.5-5.0	463 (95.9)
Diabetes <10 years	176 (35.9)	>5.0	6 (1.2)
Diabetes >10 years	314 (64.1)	ABI (R) <0.9	91 (18.6)
Hypertension <5 years	153 (31.2)	0.91-1.2	382 (78.0)
Hypertension >5 years	337 (68.8)	>1.2	17 (3.4)
Non-smoker	380 (77.9)	ABI (L) <0.9	90 (18.4)
Current smoker	84 (17.2)	0.91-1.2	369 (75.5)
Ex-Smoker	24 (4.9)	>1.2	30 (6.1)
NPDR	199 (40.9)	Albuminuria (Positive)	218 (44.6)
PDR	20 (4.0)	Albuminuria (Negative)	271 (55.4)
TC < 4.0 (mmol/l)	95 (19.2)	LVH Positive	187(38.6)
TC >4.0 (mmol/l)	395 (80.8)	LVH Negative	298 (61.4)
HDL <1.0 (mmol/l)	82 (16.7)	ECHO (Normal)	25 (5.2)
HDL>1.0 (mmol/l)	408 (83.3)	(LVSD)	40 (8.2)
LDL <2.6 (mmol/l)	247 (49.9)	(LVDD)	381 (78.6)
LDL >2.6 (mmol/l)	243 (50.1)	(LVH)	34 (7.0)
TG <1.7 (mmol/l)	234 (48.5)	(Valvular disease)	99 (20.4)
TG >1.7 (mmol/l)	256 (51.5)	(Others)	14 (2.9)
HBA1C <7.0	52 (9.8)	ECG (Normal)	229 (46.7)
HBA1C >7.0	438 (90.2)	ECG (LVH)	147 (30.0)
FBG (mmol/l)<5.2	7 (1.2)	Non-significant ST-T changes	82 (16.7)
FBG (mmol/l)>5.2	483 (98.8)	Conduction defects	120 (24.5)
2Hr PPBG (mmol/l)<10	67 (10.6)	Normal (CXR)	358 (73.4)
2Hr PPBG (mmol/l)<10	423 (89.4)	Abnormal (CXR)	132 (26.6)

Data in n(%). FBG-Fasting Blood Glucose; 2HrPPG-2hrsPost Prandial Glucose; ABI-Ankle Brachial Index (Right)(Left); LVH-Left Ventricular Hypertrophy; NPDR- Non Proliferative Diabetic Retinopathy; PDR- Proliferative Diabetic Retinopathy; HbA1C-Glycated Hemoglobin; TC-Total cholesterol, TG-Triglycerides; Sodium (Na LDL-Low Density Lipoprotein; HDL- High Density Lipoprotein, CXR- Chest X-ray; SYS.BP-Systolic Blood Pressure; BMI-Body mass index

The basics are shown in Table-I. The frequency of abnormal positive exercise test and myocardial perfusion images was 47.94%, and the confirmation of CAD was confirmed with angiography in 21%.

Table-II (a) : Angiographic finding in patients with abnormal perfusion scan/stress test with regard to patient characteristics

Variable (n)	*Normal Coronaries (n=49)*	*SVDCAD (n=22)*	*DVCAD (n=36)*	*TVCAD (n=51)*	*Stress test/MPI (237) n(abnormal)/n(total)(%)*
Male (65)	11 (17.3)	13 (20.54)	14 (22.12)	27 (31.0)	27/70 (38.6%)
Female (93)	38 (60.4)	9 (14.22)	22 (34.76)	24 (37.92)	210/420 (50.0%)
Þ- value	0.027*	0.043*	0.948	0.013*	0.076
Age (years)<50 (17)	10 (15.8)	1 (1.55)	4 (6.32)	2 (3.16)	88/190 (46.3%)
Age (years) >50 (141)	39 (61.62)	21 (33.18)	32 (50.56)	49 (77.42)	149/299 (49.8%)
Þ-value	0.028*	0.4834	0.9999	0.095	0.448
BMI Normal (11)	1 (1.58)	1 (6.3)	1 (6.3)	8 (50.0)	16/38 (42.1%)
Overweight (44)	14 (22.18)	8 (11.8)	4 (5.9)	18 (26.5)	68/150 (45.3%)
Obese (103)	34 (53.72)	13 (8.6)	31 (20.5)	25 (16.6)	153/302 (50.7%)
Þ –value	0.631	0.7582	0.0098*	0.0059*	0.409
Sys.BP (mmHg) <130 (21)	8 (24.2)	1 (3.0)	5 (15.2)	7 (21.2)	34/64 (53.1%)
Sys.BP (mmHg)>130 (137)	41 (20.3)	21 (10.4)	31 (15.3)	44 (21.8)	203/426 (47.7%)
Þ- value	0.775	0.329	0.977	0.941	0.495
Diabetes <10 years (49)	21 (28.8)	8 (11.0)	7 (9.6)	13 (17.8)	74/176 (42.0%)
>10 years (109)	28 (17.3)	14 (8.6)	29 (17.9)	38 (23.5)	163/314 (51.9%)
Þ- value	0.067	0.747	0.149	0.423	0.045*
Non-smoker (109)	37 (22.2)	14(7.8)	26(15.0)	32(19.2)	169/380 (44.5 %)
Smoker (41)	9 (16.4)	7 (12.7)	10 (18.2)	15 (27.3)	55/84 (65.5%)
Ex-smoker 8)	1 (9.1)	2 (18.2)	1 (9.1)	4 (36.4)	11/24 (45.8%)
Þ- value	0.4932	0.2133	0.7955	0.2195	0.002*
Retinopathy (None) (45)	21 (30.4)	8 (11.6)	8 (11.6)	8 (11.6)	69/199 (34.7%)
(NPDR) (105)	26 (17.0)	13 (8.5)	27 (17.6)	38 (24.8)	155/268 (57.8%)
(PDR) (8)	2 (16.7)	1 (8.3)	1 (8.3)	4 (33.3)	12/20 (60.0%)
Þ- value	0.0751	0.7918	0.4828	0.0293*	<0.001*
LDL-C< 2.6 (mmol/l) (77)	31 (27.9)	10 (9.0)	15 (13.5)	21 (18.9)	112/242 (46.3%)
LDL-C >2.6 (mmol/l) (81)	17 (13.9)	12 (9.8)	21 (17.2)	30 (24.6)	121/241 (50.2%)
Þ- value	0.013*	0.829	0.549	0.375	0.4399
HDL-C <1.0 (mmol/l) (26)	3 (7.0)	2 (4.7)	8 (18.6)	13 (30.2)	44/82 (53.7%)
HDL-C >1.0 (mmol/l) (132)	46 (24.0)	20 (10.4)	28 (14.6)	38 (19.8)	193/408 (47.3%)
Þ- value	0.023*	0.384	0.669	0.195	0.3723
HBA1C <7.0 (11)	4 (21.1)	2 (10.5)	3 (15.8)	2 (10.5)	20/47 (42.6%)
HBA1C >7.0 (147)	45 (21.0)	20 (9.3)	33 (15.0)	49 (22.4)	215/438 (49.1%)
Þ- value	0.999	0.697	0.999	0.38	0.485
ABI <0.9 (75)	7 (4.4)	17 (10.7)	24 (15.1)	37 (23.0)	75/90 (83.3%)
ABI >1.2 (14)	2 (14.3)	3 (14.3)	4 (14.3)	5 (14.3)	15/30 (50.0%)

Table-II (a) demonstrates the association between several variables, positive detection tests and the results of angiography. Diabetes, smoking, diabetic retinopathy, proliferative non-proliferative, proliferative non-proliferative, albumin and peripheral vascular disease were defined by a statistically significant relationship <0.9 ABI.

Table-II (b) : Results from Logistic Regression for predictors of coexistence of coronary artery disease

Variable	*Regression Coefficient*	*Odds Ratio*	*95% CI*
Current Smoker	1.185	3.27	1.65-6.50*
Ex-smoker	0.6853	1.98	0.711-5.54
NPDR	0.5482	1.73	1.11-2.69*
PDR	-0.09002	0.914	0.299-2.79
ABI (R) (<0.90)	0.7606	2.14	1.10-4.16*
ABI (L) (<0.90)	1.336	3.8	1.85-7.80*
Albuminuria	0.8835	2.42	1.56-3.75*
LVH	0.9188	2.51	1.59-3.94*

*Statistically significant; Data is n(%). ABI-Ankle Brachial Index (Right) (Left), LVH-Left Ventricular Hypertrophy; NPDR-Non-Proliferative Diabetic Retinopathy, PDR- Proliferative Diabetic Retinopathy

Table-II (b) gives the results of CAD logistic regression analysis estimates. Retinopathy, Smoking, albuminuria, Left ventricular hypertrophy and peripheral vascular disease was significant.

DISCUSSION:

ASCARD diabetes is the only study that selects high atherogenic risk factors associated with diabetes in the detection of CAD. This study showed that there was a strong relationship between risk factors and the presence of asymptomatic CAD and the previous study (DIAD), which did not show such a relationship. In this study, the prevalence of abnormal results was 48%, the tested angiographic CE was 21%, and this rate was higher than most of the previously reported studies. Previous studies report that retrospective studies (60%) have a very high prevalence and data, and that 2 diabetes studies justify the determination of any type of research that indicates a very low rate, and this is not confirmed by the general principle. Diabetes, diabetes, coronary artery disease, 80% of patients with 50% postmortem were increased with the high rate report of Goraya disease and bowel disease. Death The prevalence of abnormal stress in 1053 patients in the center of Joslin was 33%. 925 electrocardiogram and thallium scintigraphy were performed in the study of atherosclerosis and diabetes group in Milan (MISAD). Stress tests reported the prevalence of anomalies in 12.1% of patients, 6.4% of asymptomatic CAD and 30.2%, and prevalence of% 60 of '60%. In our study, the highest prevalence of asymptomatic CAD was 14.8 ± 7.1 years, and the mean duration was related to the inclusion of elderly, obese and overweight patients. Of the patients, 19% had albuminuria, 53% had environmental vascular disease, 38% had left ventricular hypertrophy and 90% had HbA1c> 7%. In our study, the sensitivity of myocardial perfusion images to angiographically detect coronary heart disease was approximately 70%, which was previously reported by Kang et al. 138 diabetic patients were evaluated by invasive angiography. In this study, 31 patients with three-vessel disease and four patients with four-vessel disease underwent CABG. Similarly, forty-four patients were placed with PTCA and stent. Thirty patients were not considered adequate for intervention, so they were optimized for medical treatment. The results were comparable to symptomatic diabetic patients with bypass angioplasty revascularization study (BARI). Similarly, the pilot study of asymptomatic cardiac ischemia (ACIP) revealed that revascularization reduced negative outcomes in asymptomatic patients. The 6-year survival rate of asymptomatic diabetic patients has been shown to be higher in coronary artery surgery records.

CONCLUSION:

In this study, it was seen that high-risk type 2 diabetics were detected for high risk CAD due to the presence of dyslipidemia an d hypertension and 21% of the patients with CAD were found to be angiographically proven. In order to support the detection of high-risk type 2 diabetics for asymptomatic CAD, the lack of cost-effectiveness and outcome data should be considered.

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