ORIGINAL ARTICLE

JIACM 2022; 23 (1-2): 6-11

Prevalence of Coronary Risk Factors in Patients with Type 2 Diabetes Mellitus

Prashant Kumar Swarnkar, Abhilash Kumar**, Ajai Kumar Garg***, AK Agarwal****, Esha Singhal******

Abstract

***Introduction:** Diabetes mellitus (DM) remains as one of the impertinent global epidemics of the twenty-first century. Coronary artery disease (CAD) is more common in diabetics and is more extensive. Identification and estimating the prevalence of various coronary risk factors in type 2 DM is essential in preventing/delaying the coronary heart disease.*

***Aims and objectives:** This study aims to assess the prevalence of coronary risk factors in patients with type 2 DM and also to compare and co-relate assessed risk factors in these patients with or without electrocardiographic and/or symptomatic evidence of coronary heart disease.*

***Methods:** This was a cross-sectional study conducted for a period of eighteen months in a tertiary care teaching hospital in North India. 104 patients diagnosed as a case of type 2 DM were included. Detailed history, clinical findings and relevant laboratory investigations were recorded. Non-modifiable risk factors like age, sex, family history and modifiable ones like smoking, obesity, hypertension, hypercholesterolaemia, hypertriglyceridaemia and microalbuminuria were analysed in detail.*

***Results:** The mean age of patients was 53.7 years in male group and 52.6 years in the female group with mean duration of diabetes as 8.8 years. 21.2% had family history of CHD. 14.4% of the patients had BMI greater than 25 and hypertension was prevalent in approximately 1/3 rd. of the cases. Mean HbA1c in the study group was 7.4 %. Prevalence of CHD among type 2 DM patients was 15.4% and the prevalence of CHD increased with age and duration of diabetes. The mean BMI and WHR of the patients with CHD (24.8 and 0.98 respectively) were observed to be higher than the patients without CHD (21.1 and 0.84 respectively). Hypercholesterolaemia was seen in 42.3%, hypertriglyceridaemia in 51.9%, low HDL-cholesterol levels in 40.3% and microalbuminuria was seen in 33.7% of the cases.*

***Conclusion:** This study revealed significant prevalence of both CHD and coronary risk factors in type 2 DM subjects. Serum cholesterol ($p = 0.000004$), LDL ($p = 0.00003$), HbA1c ($p = 0.002$), microalbuminuria ($p = 0.000006$) and hypertension ($p = 0.00006$) were all significant predictors of CHD in both the sexes. Among the female type 2 DM cases, in addition BMI ($p = 0.01$), Waist-hip ratio (WHR) ($p = 0.003$) and low HDL level ($p = 0.008$) are important correlates of CHD. However, if confounding between variables was taken into consideration then microalbuminuria alone appeared to be the best model for CHD prediction.*

Introduction

Diabetes mellitus has become a global pandemic. It is also called 'the disease of complications' highlighting the higher mortality, morbidity and economic burden. As per the International Diabetes Federation(IDF), approximately 463 million adults (20 - 79 years) were living with DM worldwide in 2019 which will rise to 700 million in 2045. 79% of adults with DM are living in low- and middle-income countries.

The rise of type 2 DM in South Asia is estimated to be more than 150% between 2000 and 2035. Although ageing, urbanisation, and associated lifestyle changes are the major determinants for the rapid increase, an adverse intrauterine environment and the resulting epigenetic changes could also contribute in many developing countries[1].

India is the country with the second highest number of DM cases after China, with 72.96 million diabetes cases estimated in 2019. This is expected to increase up to 109 million in 2035[2]. There are large dissimilarities in diabetes prevalence between states in India. DM is found to be maximum in the southern part of the country[3]. The prevalence in urban areas ranges between 10.9% and 14.2% and prevalence in rural India was 3.0 - 7.8% among population aged 20 years and above with a much higher prevalence among individuals aged over 50 years (INDIAB Study)[4].

Silent ischaemia and infarction are more common among diabetics. Hence, the diagnosis is often missed. Sudden death is 50% higher in diabetic men and 300% higher in diabetic women indicating higher prevalence and mortality due to CAD among diabetic females[5]. It is estimated that, number of diabetics is going to be doubled by 2020 and

**Senior Resident, **Post-Graduate Resident, ****Professor Emeritus, *****Assistant Professor, Department of Medicine, Sharda School of Medical Sciences and Research, ***Associate Professor, Department of Medicine, Government Institute of Medical Sciences, Greater Norda - 201 308, Uttar Pradesh.*

***Corresponding Author:** Dr Esha Singhal, Assistant Professor, Department of Medicine, Sharda School of Medical Sciences and Research, Greater Noida - 201 308, Uttar Pradesh. Tel: 9823696163, E-mail: prateekesha2504@gmail.com.*

CAD among them is going to be tripled. It is going to manifest as "epidemic of diabetes and CAD" in developing countries, especially in India. As type 2 DM shares several risk factors in common with coronary artery disease (CAD), such as age, physical inactivity, obesity, stress, hypertension and dyslipidaemia, an increase in the prevalence of diabetes indirectly implicates an escalating risk of CAD as well[6,7]. Diabetic patients have two to four times increased CAD risk, and CAD has been reported to occur two to three decades earlier in diabetic patients as opposed to non-diabetics[6].

The present study was aimed to identify and establish the prevalence of various coronary risk factors in type 2 DM with or without any evidence of coronary artery disease.

Material and methods

This was a cross-sectional prevalence, analytical study conducted for a period of 18 months in a tertiary care teaching hospital in North India. Informed consent was taken from each patient. 104 known patients of type 2 DM treated with dietary restriction and/or oral hypoglycaemics agents and/or insulin, without the history of ketosis and congestive heart failure, attending the diabetic clinic in the department of General Medicine were included.

Patients presented with history of diabetes were evaluated and thorough history was taken including modified Rose questionnaire, to determine the presence of 'angina' or 'pain of possible infarction[8]. A thorough physical examination was conducted. Blood pressure of all the patients was measured twice with dial sphygmomanometers. Standing height, weight, and waist (the smallest girth between the costal margin and iliac crest) and hip circumference (at the inter-trochanteric level) was also measured.

Resting 12-lead electrocardiograms (ECG) was analysed according to the Minnesota codes. The quantitative determination of glycated haemoglobin (HbA1c) was done using standard glycated haemoglobin kit. Glucose, urea, serum creatinine, uric acid, cholesterol, HDL-cholesterol, triglycerides, VLDL and LDL-cholesterol was assayed by the standard laboratory methods. Gross albuminuria and ketonuria was tested using the Ames multiple reagent strips. Patients whose urine specimen was negative for gross albuminuria (≥ 300 mg/l) were evaluated further for microalbuminuria (MAU). All laboratory investigations were carried out in laboratory of the institution or authorised by the institution.

The data obtained was analysed using SPSS Software version 23. Descriptive results were expressed as Mean and SD of various parameters in the different groups. The mean difference between the continuous variables was assessed using student t-test and categorical variables using chi-square test. P-values less than 0.05 considered as significant and P-values less than 0.001 considered highly significant.

Results

A total of 104 patients (48 males and 56 females) of type 2 DM who fulfilled the inclusion criteria were analysed. The clinical, anthropometric and biochemical features of the study group are shown in Table I. Among females, clustering of risk factors was seen in the age group > 60 years. Whereas among males the age group 51 - 60 years seemed to harbour the maximum risk factors.

Table I: Characteristics of the study group.

	Male N = 48	Female N = 56
Age in yrs. (Mean ± SD)	53.7 (± 8.17)	52.6 (± 7.05)
Duration of DM in yrs. (Mean ± SD)	8.6 (± 6.09)	9.1 (± 5.28)
Smokers	14 (29.2%)	1 (1.8%)
Alcohol consumers	14 (29.2%)	Nil
Sedentary workers	37 (77.1%)	49 (87.5%)
Family history		
DM	24 (50%)	26 (46.4%)
CHD	9 (18.7%)	13 (23.2%)
HT	4 (8.3%)	5 (8.9%)
CVA	3 (6.2%)	1 (1.8%)
BMI (Mean ± SD)	21.3 (± 3.64)	22.2 (± 4.80)
BMI > 25 (N (%)]	5 (10.4%)	10 (17.8%)
Overweight [N (%)]	4 (8.3%)	8 (14.3%)
WHR (Mean ± SD)	0.94 (± 0.09)	0.87 (± 0.07)
Apple-shaped [N (%)]	20 (41.6%)	29 (51.7%)
Systolic pressure (Mean ± SD)	134.36 (± 19.67)	132.28 (18.92)
Diastolic pressure (Mean ± SD)	82.99(± 9.09)	81.76 (± 8.51)
Prevalence of HT (History and/or exam^n)	16 (33.3%)	19 (33.9%)
Blood sugar fasting	155.7 (± 53.92)	173.6 (± 71.70)
Post-Prandial Mean (± SD)	243.4 (± 71.05)	250.9 (± 82.04)
HbA1c (mean ± SD)	7.43 (± 2.88)	7.42 (± 2.53)
HbA1c < 8.5	32 (66.6%)	41 (73.2%)
8.5 - 9.4	8(16.6%)	7 (12.5%)
>= 9.5	8 (16.6%)	8 (14.3%)
Total cholesterol* > =200 mg/dl	18 (37.5%)	26 (46.4%)
HDL Chol. < = 40 mg/dl	18 (37.5%)	24 (42.8%)
LDL Chol. > = 140 mg/dl	14 (29.2%)	16 (28.6%)
S. Triglycerides > = 150 mg/dl	23 (47.9%)	31 (55.3%)
Gross albuminuria	3 (6.2%)	2 (3.6%)
Microalbuminuria	16 (33.3%)	19 (33.9%)
Total albuminuria	19 (39.6%)	21 (37.5%)

Compared to females, significantly more male diabetic subjects were current smokers and alcohol consumers. 29.2% of the diabetic men were found to be currently smoking and/or consuming alcohol, 82% were involved in sedentary physical activity and 21.1% had family history of CHD. The mean triglyceride levels, nephropathy and hypertension were significantly higher among the male smokers compared to those who did not. Neither the anthropometric measurements nor the mean levels of total cholesterol, HDL, LDL and HbA1c varied significantly among the male smokers and non-smokers.

Central obesity was found to be much more prevalent than overall obesity, especially among females.

Approximately one-third of the patients in this study were hypertensive. Among these, 21 patients were diagnosed cases of hypertension at the beginning of study, with 9 patients inadequately controlled on treatment. 14 patients were detected to be hypertensive during the study period. Among hypertensive females, the mean values of BMI, WHR, total cholesterol, LDL and triglycerides was significantly higher. Also, nephropathy was significantly higher in hypertensive compared to the non-hypertensive females (69.2% vs 23.4%).

The hypertensive males had higher mean values of WHR, total cholesterol, LDL, triglycerides and HbA1c, with a significant p-value in all. The mean BMI values were also higher in hypertensive males, but p-values failed to achieve significance. 77.8% of hypertensive males had evidence of nephropathy compared to 28.0% of non-hypertensives.

15.4% of diabetic patients were found to have coronary heart disease. In these patients, the values of mean age, diabetes duration, weight, BMI, waist circumference, WHR, both systolic and diastolic blood pressure, blood glucose, total cholesterol, LDL, VLDL, triglycerides and HbA1c were significantly higher than in those without CHD.

Table II shows the prevalence of CHD in the study group.

Table II: Prevalence of CHD.

	Male, N = 48	Female, N = 56
RQ positive	8 (16.7%)	5 (8.9%)
Past history positive	2 (4.2%)	4 (7.1%)
ECG evidence of CHD	9 (18.7%)	5 (8.9%)
Total CHD	11 (22.9%)	5 (8.9%)

Table III shows the comparison of the biochemical features of the patients with and without CHD in the study group.

Table III: Comparison of the risk factors (Biochemical factors).

	Without CHD [N (%)]		With CHD [N (%)]	
	Female	Male	Female	Male
Chol. > = 200	20 (39.2%)	9 (24.3%)	4 (80%)	10 (90.9%)
HDL < = 40	18 (35.3%)	16 (43.2%)	4 (80%)	3 (27.2%)
LDL > = 140	12 (23.5%)	7 (18.9%)	3 (60%)	6 (54.5%)
TGs > = 150	27 (52.9%)	12 (32.4%)	3 (60%)	9 (81.8%)
HbA1c < 8.5	38 (74.5%)	27 (72.9%)	2 (40%)	6 (54.5%)
8.5 - 9.4	7 (13.7%)	4 (10.8%)	1 (20%)	3 (27.3%)
> = 9.5	6 (11.8%)	6 (16.2%)	2 (40%)	2 (18.1%)
Gross albuminuria	1(1.9%)	1 (2.7%)	1 (20%)	2 (18.1%)
Microalbuminuria	16 (31.4%)	11 (39.7%)	2 (40%)	7 (63.6%)
Total albuminuria	17 (33.3%)	12 (32.4%)	3 (60%)	9 (81.8%)

In patients with nephropathy, both males and females had higher mean values of WHR, BMI, total cholesterol, LDL, triglycerides and HbA1c, compared with those without nephropathy. Also, the prevalence of hypertension was much more common in patients with nephropathy than in those without. Table IV shows the regression analysis for the various parameters. Using logistic regression analysis microalbuminuria was found to be the best model and hence, the most significant predictor of CHD in either sex.

Table IV: Multiple logistic regression analysis dependent variable CHD.

Variable	Deviance	Model P-value	Variables Significance P-value
Age	219.7	0.0029	0.1992
Sex	219.7	0.0028	0.2052
Duration of DM	221.0	0.0024	0.5779
Smoker	208.6	0.0121	0.0010
Alcohol	219.8	0.0028	0.2054
WHR	200.2	0.0322	0.0001
BMI	219.6	0.0029	0.1817
HTN	213.5	0.0066	0.0078
CHOL >= 200	205.7	0.0172	0.0002
HDL <= 40	218.3	0.0034	0.0813
LDL >= 140	203.7	0.0217	0.0001
TGs >= 150	203.9	0.0214	0.0001
HBA1C	195.5	0.0039	0.0278
Microalbuminuria	148.1	0.8238	0.0000

Discussion

Cardiovascular disease is a common comorbidity in type 2 DM and its prevalence has been rising over time. Present study assessed risk factors in 104 type 2 DM patients, followed by comparison and correlation in patients with and/or without electrocardiographic and/or symptomatic evidence of coronary heart disease.

Various studies report widely variable prevalence of CHD among diabetics in India between 6.6% to 33%. This study reported prevalence as 15.4%. Among 104 patients, 56 were females and 48 were male patients. The mean age of all the participants was 53.16 ±7.61 years. The mean age in the CHD group was 56.9 ± 4.8 years and 52.6 ±8.32 years in non-CHD group. Males were commonly affected in the group with and without CHD. Mean age of females in the group without CHD was statistically significant in comparison to with CHD. The Rancho Bernardo study also proved that diabetic females had more classical cardiovascular risk factors than males and also how diabetes eradicates female cardio-protection[9].

Present study also showed significantly higher incidence of the CHD in cases with sedentary work style. Compare to female, significantly more male diabetic subjects were current smokers and alcohol consumers. The family history of DM, hypertension, cerebrovascular accident, and CAD was found to be significantly higher in group with CHD. Similar results have been reported by various studies conducted across India[10,11].

Mean duration of diabetes was around 8 years, slightly higher in females than males. Mean duration of DM of males in the group without CHD was statistically significant in comparison to the CHD group.

55% cases of stable angina, 28.3% cases of unstable angina and 16.7% cases of cerebrovascular accident were identified. Only 15% patients presented with diabetic retinopathy. This observation strengthens the view that, macrovascular complications are duration independent, whereas microvascular complications are duration dependent.

Mean BMI in this study was 21.8 (±4.32) [among males, 21.3 (±3.64) and among females 22.2 (±4.20)]. 14.4% of the patients had BMI greater than 25. The relationship between obesity and diabetes is widely known. DM epidemic can be attributed to the increasing incidence of obesity. It is estimated that about 60 - 90% of all type 2 DM patients are obese (BMI > =30 kg/m2) or overweight (BMI > = 25 kg/m2).

The significance of BMI as an index of obesity has been downgraded with the advent of waist-hip ratio (WHR) for the measurement of regional (central) obesity. It is known by various Indian migrant studies[12,13] that, increased W:H ratio and thus central obesity was very common among diabetic people of Indian origin. It acts as a risk factor for CAD, even in the absence of other risk factors. The mean BMI and WHR of the patients with CHD were observed to be higher than the patients without CHD in this study.

In the study conducted by McKeigue[1] involving South Asian migrants in UK, it was found that these population had higher mean WHR confirming the existence of an insulin resistance syndrome as compare to the European group. Such higher incidence of central obesity leading to diabetes and coronary artery disease resulted in high mortality in South Asians. In UKPDS[14], the WHR for men and women was respectively 0.95 ±0.06 and 0.87 ± 0.08. Hence, presence of central obesity is an important risk factor for people of Indian origin than Western people.

The present study showed prevalence of hypertension in diabetics as 33.6%. Also, the prevalence of hypertension was much more common in patients with nephropathy (77.8%). In the patients with coronary heart disease, the values of mean systolic and diastolic blood pressure were significantly higher than in those without CHD. Venugopal *et al*[15] reported prevalence of hypertension as 25.6% in type 2 DM patients. Hypertension is generally attributed to hyperinsulinemia in diabetics, with resulting increase in renal sodium retention and sympathetic nervous system activity. It is well known that presence of hypertension along with diabetes increases the complications and two fold rises in cardiovascular related mortality.

Lipid abnormalities were widely prevalent in this study, especially hypertriglyceridaemia (51.9%) was found to be the major type of dyslipidaemia. Studies in China and other Asian countries have shown similar results in type 2 DM.[16,17] High cholesterol (>200 mg%), high LDL (>140 mg%), low HDL (< 40 mg%) and high triglycerides (>150 mg%) had a prevalence of 87.5%, 56.2%, 43.7% and 75% in CAD group, respectively as compared to non-CAD group, who had prevalence of 32.9%, 21.6%, 38.6% and 44.3%, respectively. The Strong Heart Study by Lee *et al*[18] reported adult diabetics with high TG and low HDL levels had 1.54-fold greater HR (95% CI 1.15 - 2.06) for CHD (P value 0.003) than non-diabetic adults. Milan study[19] reported statistically significant correlation of serum triglyceride ($p = 0.002$) and serum cholesterol ($p < 0.014$) levels with silent CAD17 while, Gazzaruso *et al* found a correlation of mean serum HDL and silent CAD ($p < 0.05$)[20].

Increased prevalence of microalbuminuria has been consistently reported to occur in diabetic individuals. Microalbuminuria was found in 33.6% of patients in this study. The appearance of microalbuminuria in diabetic patients predict development of coronary artery disease

and macroalbuminuria. Patel *et al*[21], Taneja *et al*[22], Jadhav *et al*[23] observed prevalence of microalbuminuria ranges from 25% to 35%. Various researchers have reported higher prevalence of microalbuminuria in Indians compared to other ethnic groups.

This study has also brought out a significant association of microalbuminuria with body mass index, in the 15 patients with BMI of more than 25, 8 had microalbuminuria (53.33%). Similar findings have been brought forth by other studies[22,23].

The incidence of microalbuminuria was significantly associated with the presence of ischemic heart disease (p = 0.011), hypertension (p = 0.001) and body mass index (p = 0.027) more than 25 kg/m^2. It was also well known that retinopathy and microalbuminuria have a high concordance rate. Several studies have highlighted the occurrence of microalbuminuria as a marker of ischemic heart disease. This study also underscored this point. 56.3% of the patients with CHD had microalbuminuria in this study.

Summary

This study revealed significant prevalence of both CHD (15.4%) and coronary risk factors in type 2 DM subjects. Also, the prevalence of CHD increased with age and duration of diabetes in this study.

Mean duration of DM was 8.3 years in the group without CHD and 10.8 years in the group with CHD. Mean duration of DM of males in the group with CHD was statistically significant in comparison to the non-CHD group.44.4% of male were smoker in the group with CHD; was statistically insignificant in comparison to the non-CHD group.

The relationship between obesity and diabetes is widely known. 14.4% of the patients had BMI greater than twenty-five. The mean WHR in this study was 0.9 while employing the standard method. The mean BMI and WHR of the patients with CHD (24.8 and 0.98 respectively) were observed to be higher than the patients without CHD (21.1 and 0.84 respectively). There was a significant higher mean HbA1c among the CHD group (8.37) compared to non-CHD (7.74) which is statistically significant.

In this study, hypertension was prevalent in approximately 1/3rd of the diabetics. Diabetic dyslipidaemia is a recognised entity. Present study revealed hypertriglyceridaemia (51.9%) and low HDL-C levels (40.3%) as major types of dyslipidaemia in type 2 DM subjects.

Microalbuminuria tended to be 2.54 times more common in the age group of above 50 years as compared to the age group of less than 50 years. This study has also brought out a significant association of microalbuminuria with body mass index of more than 25 kg/m^2 of the 15 patients with BMI of more than 25, 8 of them had microalbuminuria (53.3%). Out of the total 35 patients with microalbuminuria, 15 of them had ischemic heart disease. Using logistic regression analysis microalbuminuria was found to be the best model and hence the most significant predictor of CHD in either sex.

Conclusion

There was a high prevalence of both CHD and coronary risk factors in the type 2 DM subjects. Even modifiable standard risk factors such as smoking (14.4%) and sedentary working (82.7%) habits were prevalent in a significant proportion of the case. Although overall obesity (30.5%) was not so common among Indian type 2DM patients, the prevalence of central obesity (78.8%) was found to be considerably high.

Diabetic dyslipidaemia was commonly present with hypertriglyceridaemia constituting the most common abnormality present in about half the cases (51.9%). Microalbuminuria was prevalent in a significant number of these cases (33.6%). Serum cholesterol (p = 0.000004) LDL (p = 0.00003), HbA1c (p = 0.002), microalbuminuria (p = 0.000006) and hypertension (p = 0.00006) were all significant predictors of CHD in both the sexes. Among the female T2DM cases, Waist-hip ratio (WHR) (p = 0.003) and low HDL level (p = 0.008) are important correlates of CHD. However, if confounding between variables was taken into consideration then microalbuminuria alone appeared to be the best model for CHD prediction.

References

1. Nanditha A, Ma RC, Ramachandran A *et al*. Diabetes in Asia and the Pacific: Implications for the Global Epidemic. *Diabetes Care* 2016; 39: 472-85.
2. Guariguata L, Whiting DR, Hambleton I *et al*. Global estimates of diabetes prevalence for 2013 and projections for 2035. *Diabetes Res Clin Pract* 2014; 103: 137-49.
3. Anjana RM, Deepa M, Pradeepa R *et al*. ICMR–INDIAB Collaborative Study Group. Prevalence of diabetes and prediabetes in 15 states of India: results from the ICMR-INDIAB population-based cross-sectional study. *Lancet Diabetes Endocrinol* 2017; 585: 96.
4. Anjana RM, Pradeepa R, Deepa M *et al*. The Indian Council of Medical Research-India Diabetes (ICMR-INDIAB) study: methodological details. *J Diabetes Sci Technol* 2011; 5: 906-14.
5. Nathan DM, Meigs J, Singer DE. The Epidemiology of Cardiovascular Disease in Type- 2 Diabetes Mellitus: How Sweat it is.Or is it. *The Lancet* 1997; 350: 14-8.
6. Haffner SM, Lehto S, Rönnemaa T *et al*. Mortality from coronary heart disease in subjects with Type 2 diabetes

and in nondiabetic subjects with and without prior myocardial infarction. *N Engl J Med* 1998; 339: 229-34.

7. Kannel WB. Metabolic risk factors for coronary heart disease in women: perspective from the Framingham Study. *Am Heart J* 1987; 114: 413-9.
8. Rahman, Muhammad Aziz *et al*. "Rose Angina Questionnaire: validation with cardiologists' diagnoses to detect coronary heart disease in Bangladesh." *Ind Heart J* 2013; 65: 30-9.
9. Connor B, Barbara A, Wingard L. Why is Diabetes mellitus a Stronger Risk Factor for Fatal Ischaemic Heart Disease in women than in Men – The Rancho Bernardo Study. *JAMA* 1991; 265: 627-31.
10. Thulaseedharan N, Augusti KT. Risk factors for coronary heart disease in NIDDM. *IHJ* 1997; 47: 471-80.
11. Turner RC, Neil HAW, Stratton IM *et al*. The United Kingdom Prospective Diabetes Group. Risk factors for coronary artery disease in non-insulin dependent diabetes mellitus (UKPDS 23). *BMJ* 1998; 316: 823-8.
12. McKeigue PM, Shah B, Marmot MG. Relation of central obesity and insulin resistance with high diabetes prevalence and cardiovascular risk in South Asians. *Lancet* 1991; 337: 382-6.
13. Dhawan J, Bray CL, Warburton R *et al*. Insulin resistance, high prevalence of diabetes, and cardiovascular risk in immigrant Asians. Genetic or environmental effect? *Br Heart J* 1994; 72: 413-21.
14. Turner RC, Millns H, Neil HAW *et al*. Risk Factors for Coronary Artery Disease in Non-insulin Dependent diabetes Mellitus: United Kingdom Prospective Diabetes Study (UKPDS:23). *BMJ* 1998; 316: 823-8.
15. Venugopal K, Mohammed MZ. prevalence of hypertension in type 2 diabetes mellitus. *CHRISMED J Health Res* 2014; 1: 223-7.
16. Narindrarangkura P, Bosl W, Rangsin R *et al*. Prevalence of dyslipidaemia associated with complications in diabetic patients: a nationwide study in Thailand. *Lipids Health Dis* 2019; 18: 90.
17. Wu JY, Duan XY, Li L *et al*. Dyslipidaemia in Shanghai, China. *Prev Med* 2010; 51: 412-5.
18. Lee JS, Po-Yin Chang, Zhang Y *et al*. Triglyceride and HDL-C Dyslipidaemia and Risks of Coronary Heart Disease and Ischaemic Stroke by Glycaemic Dysregulation Status: The Strong Heart Study. *Diabetes Care* 2017; 40: 529-37.
19. Faglia, Favales, Morabito *et al*. Milan Study on Atherosclerosis (and Diabetes (MiSAD) Group: Prevalence of unrecognised silent myocardial ischaemia and its association with atherosclerotic risk factors in noninsulin - dependent diabetes mellitus. *Am J Cardiol* 1997; 79: 134-9.
20. Gazzaruso C, Garzaniti A, Giordanetti *et al*. Silent coronary artery disease in type-2 diabetes mellitus: the role of lipoprotein (a), homocysteine and apo(a) polymorphism. *Cardiovasc Diabetology* 2002; 1: 5.
21. Patel KL, Mhetras SB, Varthakavi PK *et al*. Microalbuminuria in non-insulin dependent diabetes mellitus. *JAPI* 1999; 47: 596-601.
22. Taneja V, Sircar S, Kansra U. Microalbuminuria in normotensive non-insulin dependent diabetic subjects-associations and predictions. *J Diab Assoc India* 1997; 37: 30-6.
23. Jadhav UM, Kadam NN. Association of microalbuminuria with carotid Intima-Media thickness and coronary artery disease- A cross-sectional study in Western India. *JAPI* 2002; 50: 1124-9.

FORM IV (See Rule 8)

The following particulars regarding the ownership of the **'JOURNAL, INDIAN ACADEMY OF CLINICAL MEDICINE'** are published as called for by Rule 8 of the Registration of Newspaper (Central) 1956.

1.	Place of Publication	–	4/19 B, Jangpura B, New Delhi - 110 014.
2.	Periodicity of Publication	–	Quarterly
3.	Printer's Name	–	Dr. MPS Chawla
	Nationality	–	Indian
	Address	–	4/19 B, Jangpura B, New Delhi - 110 014.
4.	Publisher's Name	–	Dr. MPS Chawla
	Nationality	–	Indian
	Address	–	4/19 B, Jangpura B, New Delhi - 110 014.
5.	Editor's Name	–	Dr. MPS Chawla
	Nationality	–	Indian
	Address	–	4/19 B, Jangpura B, New Delhi - 110 014.

6. Name and address of individuals who own the newspaper and partners or shareholders holding more than one per cent of the total capital.

   – Indian Association of Clinical Medicine, Headquarters: Post-graduate Department of Medicine, Sarojini Naidu Medical College, Agra - 282 002 (U.P.)

I, Dr. MPS Chawla, hereby declare that the particulars given above are true to the best of my knowledge and belief.

Sd/-
Dr. MPS Chawla
Signature of Publisher

Date:
January 15, 2022