



Original Research Article

Study of Prevalence of Dyslipidemia in Women with Diabetes Mellitus - A Cross Sectional Study

Shalini M¹, Suresh Babu KP², Mounika K³, Srinivasa Murthy AG¹

¹Professor, ²Associate Professor, ³Postgraduate in Medicine,
Department of General Medicine, Sri Siddhartha Medical College, Tumkur, Karnataka, India.

Corresponding Author: Suresh Babu KP

Received: 25/03/2014

Revised: 15/04/2014

Accepted: 26/04/2014

ABSTRACT

In a developing country like India with fast industrialization and modern life style, Diabetes is a grave problem affecting large number of people. The risk of mortality is high with Coronary Artery Diseases in Diabetes which in turn is well associated with Dyslipidemia. The risk is much more in women when compared to age and sex matched population. A detailed history, clinical examination along with FBS, PPBS and Fasting lipid profile were done in 1050 women of Tumkur district in Karnataka. Among 1050 participants in the study group, 221 (21.04%) were found to be diabetic. These diabetics were in the age groups 10-20 years - 2 (0.01%), 21-30 years - 5 (0.02%), 31-40 years - 19 (0.09%), 41-50 years - 58 (26.24%), 51-60 years - 72 (32.57%) and ≥ 61 years - 65 (29.41%). Those with BMI (Body Mass Index) ≥ 25 kg/m² were 122 (55.2%) and waist hip ratio ≥ 0.9 was present in 89 (40.27%). Among these diabetics, lipid abnormalities were found in 202 (91.40%) with total cholesterol ≥ 200 mg/dl - 115 (52.03%), triglycerides ≥ 160 mg/dl - 119 (53.84%), LDL cholesterol ≥ 130 mg/dl - 108 (48.86%), VLDL cholesterol ≥ 40 mg/dl - 65 (29.41%) and HDL cholesterol ≤ 40 mg/dl - 92 (41.62%). Our study showed that there is increased prevalence of abnormal lipid profile in Diabetic population along with increased prevalence of high BMI and increased waist circumference.

Key words- Diabetes Mellitus, Dyslipidemia, Coronary Artery Disease, Women, Fasting Lipid profile, BMI, Waist Hip Circumference

INTRODUCTION

Diabetes mellitus (DM) is a metabolic disorder of multiple aetiology, characterised by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action or both.^[1]

The prevalence of diabetes mellitus is growing rapidly worldwide and is reaching epidemic proportions. It is estimated that there are currently 285 million people with diabetes worldwide and

this number is set to increase to 438 million by the year 2030.^[2] India, a developing Asian country with fast industrialization and a modern lifestyle is facing a grave problem in having the largest number of people with diabetes which is estimated to reach 80 million by the year 2030.^[3] It is close to becoming the diabetic capital of the world. The literature on Indian studies showed a threefold rise in the diabetic prevalence in rural as well as urban areas.^[4]

The most common symptom of diabetes is no symptom and by the time the disorder is diagnosed, an abnormal lipid profile, hypertension and retinal changes may be already present often. Diabetes is associated with a greater risk of mortality from coronary artery disease (CAD) which is well associated with Dyslipidemia, which is characterized by raised triglycerides, low high density lipoprotein and high small dense low density lipoprotein particles. It may be present at the diagnosis of type 2 Diabetes mellitus and is a component of the metabolic syndrome. Abnormal serum lipids are likely to contribute to the risk of coronary artery disease in diabetic patients and the determination of the serum lipid levels in people with diabetes is now considered as a standard of the diabetes care. [5]

It has been estimated that people with diabetes have increased risk of death from Ischemic Heart Disease. This risk is increased to four fold in case of women when compared to age and sex matched population due to loss of relative protection from atherosclerosis by female sex hormones after menopause.

Hence, this work is taken up to access the prevalence of Dyslipidemia among women with special Diabetes Mellitus.

Aims and Objectives

To study the prevalence of Dyslipidemia among women with Diabetes Mellitus.

MATERIALS AND METHODS

Study population- A cross sectional study of women of Tumkur district in Karnataka state. Women of 10 years and above were included in the study.

Study period- Study was conducted over a period of three months.

Study design- Population based cross sectional study.

Sample size- 1050 people were included in the study.

Sampling technique- Simple random sampling.

Study tools- Pilot tested questionnaire was used for collecting information regarding the economic status, occupation, family history, obstetric history, physical activity along with the routine data. A detailed clinical examination along with anthropometric measurements was taken. Standing body height (to the nearest 0.5 cm) was measured with a commercial stadiometer. A digital scale, with an accuracy of ± 100 g, was used to measure body weight. The waist circumference was measured in a horizontal plane, midway between the inferior margin of the ribs and the superior border of the iliac crest. The measurements were taken thrice and the mean was taken in all cases. Every subject underwent following bio chemical tests – FBS, PPBS and Fasting lipid profile. All biochemical parameters were analyzed by automated analyzer using kits provided by Transasia Biochemicals.

Statistical analysis- Was done by using Epi Info 7.1 and Microsoft Excel 2007. Results were expressed in proportions and presented in the form of graphs. Data was entered in Microsoft Excel 2007 and used for further analysis.

Ethical clearance- The clearance for the study was obtained from the ethical committee of Sree Siddhartha Medical College and Hospital.

Consent- An informed consent was taken from every participant.

RESULTS

The total number of women participated in the study were 1050 of age group 10 years and above. Among them 221 (21.04%) were diabetic. These diabetics were in the age groups 10-20 years - 2 (0.01%), 21-30 years - 5 (0.02%), 31-40 years - 19 (0.09%), 41-50 years - 58

(26.24%), 51-60 years - 72 (32.57%) and ≥ 61 years - 65 (29.41%). Among the diabetic women there were 155 (70.13%) Hindus, 61 (27.60%) Muslims and 5 (2.2%) Christians. 75 (33.93%) were pure vegetarians and illiterates were 155 (70.13%). Family history of mother being diabetic was seen in 38 (17.19%), father being diabetic was seen in 26 (11.76%) and siblings being diabetic was seen in 35 (15.83%). Those with BMI ≥ 25 kg/m² were 122 (55.2%) and waist hip ratio ≥ 0.9 was present in 89 (40.27%). Among these diabetics, lipid abnormalities were found in 202 (91.40%) with total cholesterol ≥ 200 mg/dl - 115 (52.03%), triglycerides ≥ 160 mg/dl - 119 (53.84%), LDL cholesterol ≥ 130 mg/dl - 108 (48.86%), VLDL cholesterol ≥ 40 mg/dl - 65 (29.41%) and HDL cholesterol ≤ 40 mg/dl - 92 (41.62%).

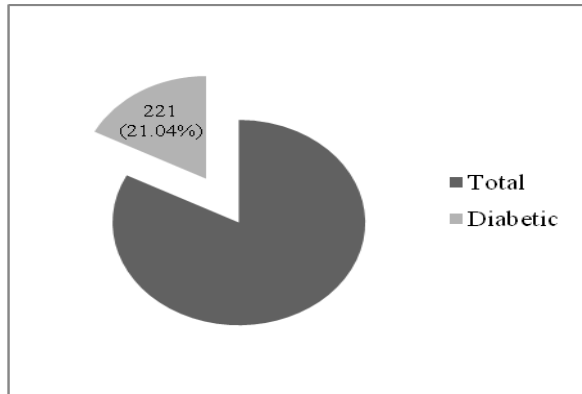


Figure 1 – The total number of diabetics in the study group.

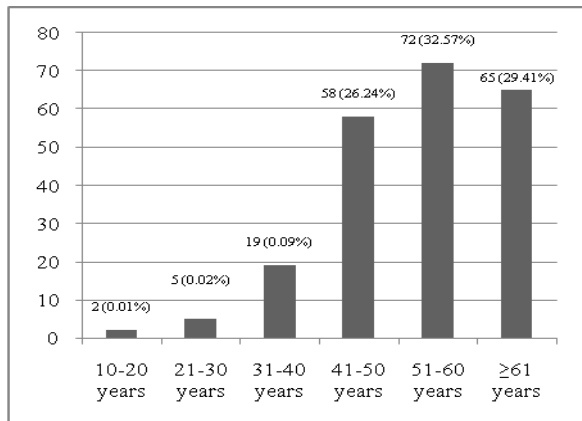


Figure 2 – Age wise distribution of diabetic women in the study group.

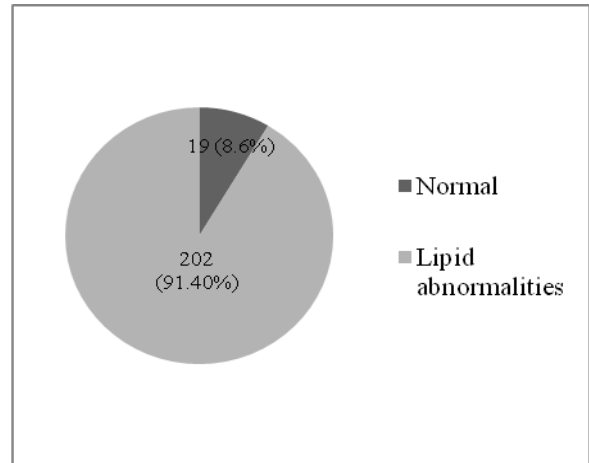


Figure 3 – Number of diabetic women with lipid abnormalities.

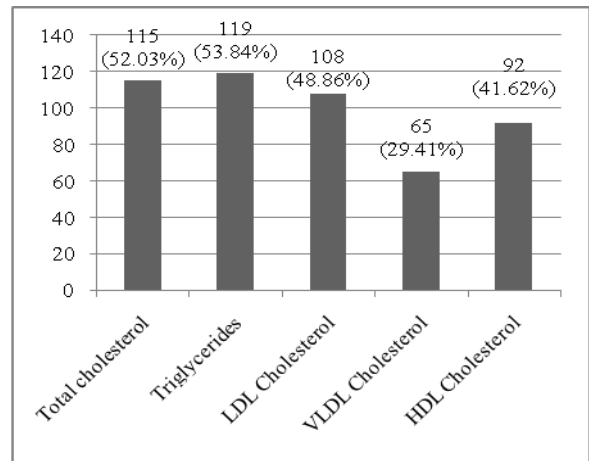


Figure 4 – The various lipid abnormalities among the diabetic women.

DISCUSSION

Patients with Diabetes Mellitus have a high prevalence of coronary artery disease (CAD). The major risk factors for Coronary Artery Disease in Diabetics are Hyperglycaemia, Dyslipidemia and Hypertension. [6]

Coronary artery disease (CAD), which is the most common cause of mortality in diabetic patients, is strongly associated with increased levels of serum low-density lipoproteins (LDL).

There is a twofold to fourfold excess risk of coronary artery disease in type 2 DM compared to non-diabetics. Patients with type 2 diabetes can have many lipid abnormalities, including hyperchylomicro-

naemia, elevated levels of very low-density lipoprotein cholesterol (VLDL-C), low-density lipoprotein cholesterol (LDLC) and triglycerides; and low levels of high-density lipoprotein cholesterol (HDL-C). Lipid abnormalities may be the result of the unbalanced metabolic state of diabetes (i.e. hyperglycaemia and insulin resistance) and improved control of hyperglycaemia does moderate diabetes-associated dyslipidaemia. [7]

Lipid abnormalities in diabetic patients are likely to play an important role in the development of atherogenesis and so are called atherogenic dyslipidemia. [6] This leads to the risk of developing Coronary Artery Disease.

In our study we have found that there is high prevalence of Dyslipidemia of 91.40%. With increase in total cholesterol ≥ 200 mg/dl in 52.03%, triglycerides ≥ 160 mg/dl in 53.84%, LDL cholesterol ≥ 130 mg/dl in 48.86%, VLDL cholesterol ≥ 40 mg/dl in 29.41% and HDL cholesterol ≤ 40 mg/dl in 41.62%.

In a study conducted by Nakhjavani et al named "Dyslipidemia in type 2 diabetes mellitus: more atherogenic lipid profile in women" the prevalence of Dyslipidemia in the form of high total cholesterol was 74.0%, triglycerides was 33.2%, LDL cholesterol was 27.2% and low HDL was 42.4%. [8] The results from this study correlates with our study showing the wide prevalence of Dyslipidemia in the Diabetic population.

In a study conducted in Southern India by Jayarama et al named "Prevalence and pattern of dyslipidemia in type 2 diabetes mellitus patients in a rural tertiary care centre, southern India" it was found that the prevalence of Dyslipidemia as a whole in women was 86.75% with single parameter Dyslipidemia of about 29.7%. In this study group Triglyceridemia was found in about 56.46% and low HDL was found in

about 72.92%. [9] The total prevalence of Dyslipidemia and triglyceridemia was found almost similar to our study group.

Ramu Kandula et al conducted a study in the Hyderabad in Andhra Pradesh in India named "A study of lipid profile in Patients with Type 2 Diabetes Mellitus" showed prevalence as follows. Dyslipidemia was present in around 86%, High total cholesterol was 41%, Triglycerides was 47%, LDL cholesterol was 64% and low HDL cholesterol was 71%. [10] The prevalence of Dyslipidemia as a whole was relevant to our study.

Our study included large number of women population in contrast to many other studies done in India.

It was observed in our study that majority of women with dyslipidemia had mixed diet and very few of them exercised. BMI was high in around half of the study group and waist to hip ratio which is very sensitive index was also found in large number.

Another interesting data – Dyslipidemia was common in lower socio economic status with illiteracy probably due to lack of knowledge regarding proper nutrition and health issues. Our study is consistent with the study conducted by Mukopadhyay et al that the triglyceride levels revealed U shaped distribution in upper, middle and lower socio economic groups respectively. While higher triglyceride levels in the upper socio economic group is very likely to be due to higher fat intake compounded with slower VLDL clearance, relatively higher levels in the lower socio economic group is mostly due to very high carbohydrate diet. [11]

CONCLUSION

In a country like India where women's health is neglected both by herself and her family, our study signifies the importance of educating the women about

Diabetes and its complications. Most importance lies in the prevention of Diabetes, obesity, Dyslipidemia a fore runner of coronary artery disease. Educating a women about her health educates a family and in turn society as a whole.

REFERENCES

1. Ramachandran A, Snehalatha C. Epidemiology and basic considerations of Diabetes. IN: API Textbook of Medicine. Ninth edition. New Delhi: Jaypee Brothers Medical Publishers (P) Ltd; 2012. 321-3
2. Anjana RM, Ali MK et al. The need for obtaining accurate nationwide estimates of diabetes prevalence in India - Rationale for a national study on diabetes. Indian Journal of Medical Research. Apr 2011; 133(4): 369–380
3. Rao C R, Kamath V G, Shetty A, Kamath A. A study on the prevalence of type 2 diabetes in coastal Karnataka. Int. J. Diabetes Dev Ctries 2010; 30(2):80-85.
4. Mohan V, Deepa M, Deepa R, Shanthirani CS, Farooq S. Secular trends in the prevalence of diabetes and impaired glucose tolerance in urban south India – The Chennai urban rural epidemiology study (CURES-17). Diabetologia 2006; 49:1175-78.
5. The American Diabetes Association. The management of dyslipidemia in adults with diabetes. Diabetes Care 1999; 22 (1):S56-S59.
6. Syed Shahid Habib. Frequency distribution of atherogenic Dyslipidemia, Saudi type 2 Diabetic patients. Pak Journal of Physiology. 2006; 2(2). 20-23.
7. Nasir Ahmed, Jahangir Khan and Tahir Saeed Siddiqui .Frequency of dyslipidaemia in type 2 diabetes mellitus in patients of Hazara division. J Ayub Med coll Abbottabad.2008; 20(2): 51-54.
8. Nakhjavani M, Esteghamati A.R, Esfahanian F and Heshmat A.R. Dyslipidemia in type 2 diabetes mellitus: more atherogenic lipid profile in women. Acta Medica Iranica, 2006; 44(2)111-118
9. Jayarama N, Madhavi Reddy, Lakshmaiah V. Prevalence and pattern of dyslipidemia in type 2 diabetes mellitus patients in a rural tertiary care centre, southern India. GJMEDPH, May-June 2012;1(3).24-28
10. Kandula R, Shegokar V. A study of lipid profile in Patients with Type 2 Diabetes Mellitus. Journal of Health Sciences. January-June.2013; 1(1). 23-26
11. Mukhopadhyay J, Kanjilal S, Biswas M. Diabetic Dyslipidemia priorities and targets in India. Medicine Update. 2010; 20.155-159.

How to cite this article: Shalini M, Suresh BKP, Mounika K et. al. Study of prevalence of dyslipidemia in women with diabetes mellitus - a cross sectional study. Int J Health Sci Res. 2014;4(5):95-99.

International Journal of Health Sciences & Research (IJHSR)

Publish your work in this journal

The International Journal of Health Sciences & Research is a multidisciplinary indexed open access double-blind peer-reviewed international journal that publishes original research articles from all areas of health sciences and allied branches. This monthly journal is characterised by rapid publication of reviews, original research and case reports across all the fields of health sciences. The details of journal are available on its official website (www.ijhsr.org).

Submit your manuscript by email: editor.ijhsr@gmail.com OR editor.ijhsr@yahoo.com