

Original Research Article

Demographic characters and factors favouring emergence of diabetes mellitus type two

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Received: 05 January 2018

Accepted: 03 February 2018

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ABSTRACT

Background: Diabetes mellitus (DM) is associated with high morbidity and mortality. It has various complications. Risk factor control is effective way of prevention. Current study was conducted to know demographic profile including risk factors related to diabetes mellitus in patients attending a tertiary health care institute of Rajasthan.

Methods: This cross-sectional study was conducted for the duration of six months. In the study 623 diabetes mellitus type 2 patients were included and subjected to evaluation of various demographic parameters and risk factors like age, sex, economic status, area of residence, obesity, hypertension (HTN), lack of exercise, smoking, dyslipidemia and positive family history.

Results: Mean age of diabetic population was 62 years. Male-female, urban-rural ratios were nearly 1:1 and 3:2 respectively. Nearly 7 % patients were found to be below poverty line (BPL). On risk factor evaluation of 623 diabetic patients it was found that 598 (96%) patients had lack of exercise, 406 (65.2%) patients had age more than 60 years, 394 (63.2%) patients had dyslipidemia, 210 (33.7%) patients were smoker as per the mentioned criteria, 144 (23.1%) patients were obese, 118 (19%) patients had HTN before emergence of DM and 90 (14.4%) patients had positive family history.

Conclusions: High prevalence of risk factors in Indian community is alarming. Health education, promotion of exercise, favourable life style, dietary modification, cessation of smoking, screening programmes for early detection of derange blood pressure, blood sugar, lipid profile can be effective prevention strategies.

Keywords: Diabetes Mellitus, Demographic characters, Risk factors

INTRODUCTION

Diabetes mellitus (DM) is a metabolic disorder characterised by hyperglycemia. It has dreadful complications and can significantly compromise quality

of life. In 2017 according to International Diabetes Federation Atlas 424.9 million people suffer from DM and the number is expected to rise further to 628.6 million by 2045.¹ Healthcare expenditures for people with diabetes are assumed to be on average two-fold

higher than people without diabetes.¹ Low and middle economic countries are having 79% of the global burden of DM in the 21st century as a result of population growth, ageing and sedentary lifestyles.¹ Currently India is having second position in respect of most number of diabetes patients after China. By 2045 it was expected that India will have 134.3 million diabetes patients, the most in world.¹ Approximately 4.0 million people aged between 20 and 79 years are estimated to die from diabetes in 2017 which is equivalent to one death every eight seconds. Diabetes accounted for 10.7% of global all-cause mortality among people in this age group. This is higher than the combined number of deaths from infectious diseases (1.1million deaths from HIV/AIDS, 1.8 million from tuberculosis and 0.4 million from malaria in 2015).¹ About 46.1% of deaths due to diabetes among the 20-79 age group are in people under the age of 60.¹ DM has well known risk factors like age, heredity, obesity, hypertension (HTN), lack of exercise, smoking, alcoholism, dyslipidemia and positive family history. Few other possible risk factors are also under evaluation.² Risk factor control can be effective not only in primary prevention but also in secondary prevention of the disease. This study was structured to find out demographic profile of DM including risk factors evaluation in order to make better strategies to control it.

METHODS

Current study was cross sectional type of observational study. It was conducted for duration of six months from June to November 2017 at department of General Medicine of a tertiary health care institute of Rajasthan. Both newly diagnosed and old cases of DM were included in the study. Diabetic patients not willing to participate in the study and/or taking antidiabetic medication were excluded. Six hundred twenty-three diabetes mellitus type 2 patients were included on indoor and outdoor basis by complete enumeration.

After informed consent all the subjects were subjected to detail history with clinical examination and all the details were taken in a pre-structured performa. All the previous medical records and reports were reviewed. Parameters like age, sex, residential address, economic status were observed. All the selected subjects were also evaluated for risk factors like age, obesity, HTN, lack of exercise, smoking, dyslipidemia and positive family history of DM.

Age equal or more than 60 years was considered as criteria of significant aging. Body mass index (BMI) equal or more than 25kg/m² was taken as criteria for obesity. HTN was taken as risk factor only if present before emergence of the disease of concern. A criterion for appropriate physical activity was taken as minimum 30 minutes walk per day for at least five days in a week. A criterion for significant smoking was taken as equal or more than 5 packs per year. Total cholesterol more than 200mg/dl or triglycerides more than 150mg/dl or HDL

cholesterol less than 50mg/dl or LDL cholesterol more than 100mg/dl were taken as criteria of dyslipidemia. Relevant statistics were applied. Simple tabulation and proportions were calculated.

RESULTS

Six hundred and twenty-three type 2 diabetes mellitus patients participated in current study age ranges from 40 to 83 years of age with mean age of 62 years. Male female ratio was nearly 1:1. Ratio of urban: rural cases was nearly 3:2. Nearly 7 % patients were found to be below poverty line (BPL) (Figure 1, 2 and 3)

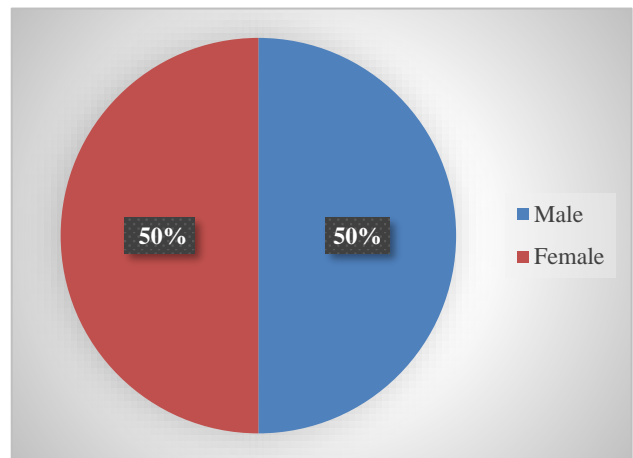


Figure 1: Gender wise distribution of diabetes mellitus patients.

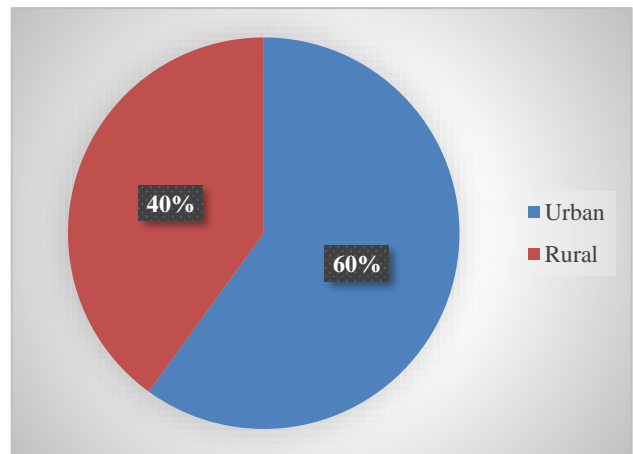


Figure 2: Rural-urban ratio in diabetes mellitus patients.

On risk factor evaluation of 623 diabetic patients it was found that 598 (96%) patients had lack of exercise, 406 (65.2%) patients had age more than 60 years, 394 (63.2%) patients had dyslipidemia, 210 (33.7%) patients were smoker as per above mention criteria, 144 (23.1%) patients were obese, 118 (19%) patients had HTN before emergence of DM and 90 (14.4%) patients had family history of DM (Figure 4).

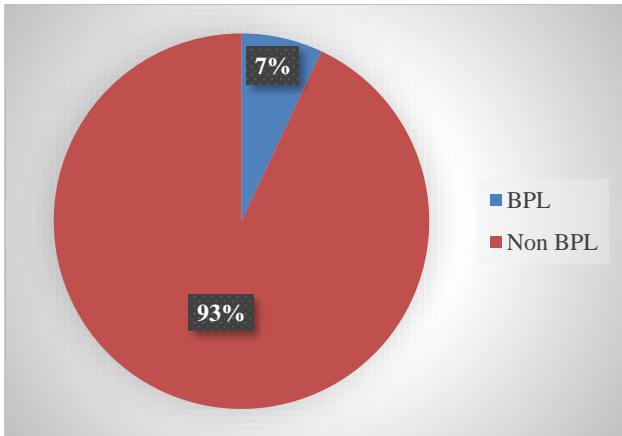


Figure 3: BPL and non BPL distribution of diabetes mellitus patients.

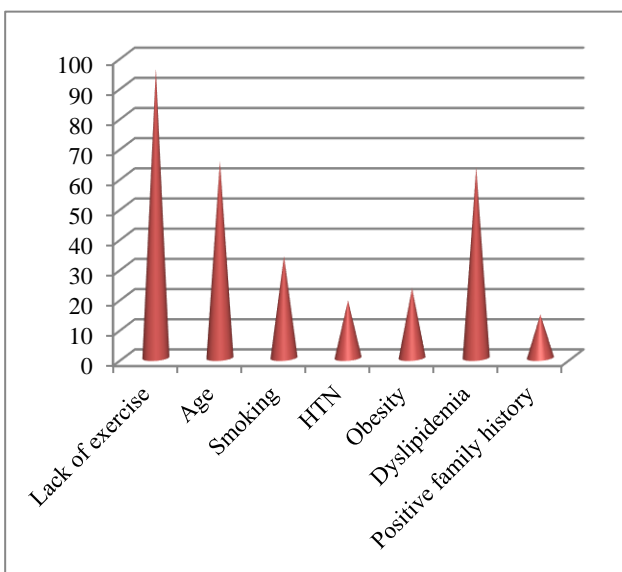


Figure 4: Distribution of risk factors in diabetes mellitus patients.

DISCUSSION

Prevention is the best strategy to control disease by its roots. Current scenario is alarming as leading causes of morbidity and mortality are non-communicable diseases like DM, HTN, coronary-cerebro vascular diseases. In 2015, 39.5 million of the 56.4 million deaths globally were due to non-communicable diseases.¹ Diabetes is among the top 10 causes of death.¹ Diabetes is one of the largest global health emergencies of the 21st century. As mentioned above that India is having the second highest number of DM cases evaluation of risk factor has greater importance. The current study was conducted to focus on demographic profile and risk factor evaluation related to DM.

In current study 34.8% of diabetic population was less than 60 years of age. Emergence of the disease at younger age is alarming and signifies the need of

identification and control of risk factors especially in younger age groups. No sex predilection was found in current study. Higher percentage of diabetic population was urban and non BPL in the study. These results showed sedentary life style and modified food habits in these groups had relation with emergence of DM.

On evaluation of 623 diabetic patients it was found that 96% patients had lack of exercise, 65.2% patients had age more than 60 years, 63.2% patients had dyslipidemia, 33.7% patients were smoker under above mentioned criteria, 23.1% patients were obese, 19% patients had HTN before emergence of DM and 14.4% patients had family history of DM.

Another Indian study by Solanki N et al found that 81.1% diabetic patients were ≥40 years of age, 83.2% diabetic patients were obese, 77.9% had sedentary life style, 72.6% were hypertensive, 30.5% had family history of diabetes and only 2.1% were active smokers.³ This study was conducted in Punjab and found higher percentage of obesity (83.2% vs 23.1%), hypertension (72.6% vs 19%) with lesser smoking habit (2.1% vs 33.7%) in comparison to current study. These deflections in results signify importance of framing region wise strategy to control risk factors.

Study by Gupta SK et al evaluated risk factors of diabetes mellitus in general population of Tamil Nadu.⁴ In this study 73% of study population had mild to moderate physical activity, 12.1 % had family history of diabetes mellitus, 39.64% individuals were in the overweight category (>25BMI). Study by Farooq et al found that 52.6% diabetics had sedentary and 26.3% had mild physical activity, 52.6% were obese or overweight, 52.6% had family history of DM, 34.2% were hypertensive, 13.1 % were smoker.⁵ This study was conducted in Karnataka also found higher percentage of obesity (52.6% vs 23.1%), positive family history (52.6% vs 14.4%) and hypertension (34.2% vs 19%) in DM patients with lower smoking habit (13.1% vs 33.7%) in comparison to current study.

Another study by Muhammad SK et al which was conducted in Kerala found 42.2% diabetics had age 60 years or above, 14.6% were obese, 7.8% were smoker as well as alcoholic while 10.2% were exclusive smoker, 34.5% were considered under less physical activity.⁶ According to study by Dassappa H et al increasing age, overweight, obesity, sedentary life style, tobacco consumption, diet habits showed statistically significant association with prevalence of diabetes and pre-diabetes in population of urban slums of Bangalore.⁷

On comparison of these Indian studies it is clear that these well-known risk factors of diabetes are present in high prevalence in Indian communities. That also highlighted the need of strengthening prevention strategy and better framework to encounter current health problems in effective way keeping area wise prevalence

of risk factors in consideration like current study found much higher prevalence of smoking habit in diabetics of Rajasthan. Smoking is known to decrease body weight, but it is associated with central obesity. Smoking increases inflammation and oxidative stress to directly damage β -cell function and to impair endothelial function. Smoking is also associated with insulin resistance and dyslipidemia.⁸ Thus smoking increases the risk of developing diabetes and aggravates the micro- and macro-vascular complications of diabetes mellitus.⁸ Special attention is needed to control habit of smoking with other factors in this region.

Dyslipidemia is one of the well-known risk factor responsible not only for DM but also for other diseases like hypertension, cardio-cerebro vascular diseases. It is associated with hereditary factors as well as personal factors like sedentary life style, impaired food habits, smoking, alcohol intake etc. Presence of dyslipidemia in high percentage (63.2%) in diabetes patients shows necessity of screening of this risk factor in general population. This study favours the Adult Treatment Panel III (ATP III) guidelines recommendation of screening of lipid profile of all persons of age 20 years and older with re-evaluation in 1 to 5 years depending on the results.⁹ Obesity is similarly associated with sedentary lifestyle, lack of physical activity, impaired food intake. Attraction of young population toward western food habits is alarming. High calories with low dietary fibres in meals can harm health in many ways and such habits must discourage. Concept of small and frequent diets is still needed to be incorporated in Indian population. Every individual must have knowledge about balanced diet, this may help to overcome this health problem.

Current study found that 96% of diabetic patients had lack of exercise. Other Indian studies also showed high prevalence of sedentary life style or lack of physical activity in DM patients as discussed above. Till now no universal guidelines have been presented regarding appropriate physical activity. This is the definite need to have an exercise programme which should be easy, uncomplicated and acceptable as much as possible. It must be integrated with education in schools and colleges to have habit of exercise in younger age groups. India can lead the world in this prospect by using ancient techniques like yoga and meditation.

According to current study 19% diabetic population had HTN before emergence of DM. Early detection and treatment of HTN can prevent or delay not only DM but also many other diseases like cardio cerebro vascular diseases, renal and retinal diseases. Multiphasic mass screening is needed for that purpose. High risk screening in all the blood relatives of diabetic patients can be appropriate strategy in country like India with larger population and limited resources.

Other studies conducted outside India in various countries also had similar results in respect of high

prevalence of risk factors worldwide showed need of global initiatives.¹⁰⁻¹³ Control over DM can be further helpful to prevent other major diseases like cardio-cerebro vascular diseases.^{14,15} Lack of knowledge about risk factors in general population is one of the major obstacles in preventive strategy. Effort should be made to improve awareness about risk factors in general population. Elimination of myths related to diseases is still a challenge for health care workers especially in rural and illiterate population.

Results of current study underline the fact that modified lifestyles with impairment of physical and dietary habits are major factors that need to have attention. Smoking is well known risk factor not only for DM but also for HTN, cardio-cerebro vascular diseases, respiratory diseases and various cancers that need to be eliminated. Screening programmes for monitoring of blood pressure, blood sugar, lipid profile must be initiated specially targeting younger age group. Meditation, yoga, adequate exercise, healthy life style and dietary habits should be promoted.

Limitation of the study: There is possibility that diagnosis of the disease made later than the emergence of the disease due to initial clinically silent phase of DM. It is difficult to assess relationship between age and emergence of the disease accurately. In current study exercise criteria was same for individuals having strenuous or sedentary lifestyle. Dyslipidemia and obesity was considered as risk factor on the basis of current values during the study and it was not clear whether it is present before emergence of concern disease or not. Family history is not concrete in many cases. Habit of smoking is less in female than male in Indian community. In current study this risk factor (smoking) was not separately evaluated according to sex. All risk factors of diabetes mellitus were not the part of study.²

CONCLUSION

Majority of risk factors of DM are highly prevalent in Indian communities. Promotion of exercise, favourable life style and dietary modification can be key factors for prevention. Screening and educational programmes should be initiated specially targeting young population. Smoking must be banned to prevent many dreadful diseases.

ACKNOWLEDGEMENTS

Authors would like to thank Dr. Kanchan Rathore, Dr. Heena Goyal, Dr. Megha Soni for sharing their pearls of wisdom with us during the course of research. Their insight and comments helped us to improve the quality of manuscript.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Mathur M, Mathur N, Singh O, Solanki J, Soni P, Sarwa A, et al. Demographic characters and factors favouring emergence of diabetes mellitus type 2. *Int J Res Med Sci* 2018;6:950-4.