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Original Research Article

An epidemiological study of type-2 diabetes mellitus among adults of 30 years and above in urban Meerut

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ABSTRACT

Background: Diabetes mellitus (DM) comprises a group of metabolic disorders that share the common feature of hyperglycemia. Type 2 diabetes accounts for over 90-95% of all people with diabetes. Aim and objectives of the study was to know the prevalence of diabetes mellitus and associated risk in an urban population of Meerut.
Methods: The present study was conducted in the field practice area of Urban Health Training Centre, LLRM Medical College, Meerut by house to house survey among adults 30 years and above.
Results: Prevalence of DM in the present study was found to be 13.1%. Among the total diabetics, 10% were known diabetics 3.1% were newly diagnosed diabetics. Socio-demographic factors associated with diabetes are age, socio-economic status, educational status and marital status while factors such as gender, religion, caste and type of family were found to be statistically insignificant.
Conclusions: Risk factors like family history, hypertension and behavioural factors like alcohol consumption and smoking were associated with diabetes prevalence.

Keywords: Diabetes mellitus, Behavioural habits, Risk factors

INTRODUCTION

Diabetes mellitus (DM) comprises group of metabolic disorders that has common feature of hyperglycemia. DM is currently classified on the basis of the pathogenic process that leads to hyperglycemia. Type 2 DM is a heterogeneous group of disorders characterized by variable degrees of insulin resistance, impaired insulin secretion, and excessive hepatic glucose production.[1] Type 2 diabetes accounts for over 90-95% of all people with diabetes.

Epidemiological transitions in India in the 21st century have led to non-communicable diseases becoming a major health problem of growing magnitude. One of the important diseases in this respect is diabetes, which is considered a 'disease of urbanization'.[2]

Prevalence of DM in urban areas of Indians 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.[3] India has an estimated 77 million people with diabetes, which makes it the second most affected in the world, after China.4 The worldwide prevalence was 9.2%. In India it is 8.9% as of 2020. One in six people (17%) in the world with diabetes is from India. The number is projected to grow by 2045 to become 134 million per the International Diabetes Federation.[4]

While recognizing an increasing prevalence of diabetes in urban population, the present study was conducted to know the prevalence of DM so that possible efforts can be made to reduce burden of the disease.

Aim and objectives

Aim and objectives were to determine the prevalence of type-2 DM among adult population of urban Meerut, and

to determine socio-demographic and risk factors associated with type-2 DM.

METHODS

Study area

The study was conducted at the Urban Health and Training Centre (UHTC) Surajkund that have ten localities, and is a field practice area of L.L.R.M. Medical College Meerut.

Study design

The design of the study was community based cross-sectional study.

Study period

The period of the study was from November 2019 to October 2020 for a period of one year.

Sample size

Taking prevalence 11.1% and absolute precision as 2.5%, sample size for the study was calculated as was calculated using formula

$$n = (1.96)^2\, pq/d^2$$

Where, n=sample size, d=p=prevalence, q=(1-p). Sample size was calculated to be 606. Taking 10% non-respondents, sample size came to be 667 which is approximated to 670.

Inclusion criteria

All males and females of age 30 years and above were included in the study.

Exclusion criteria

Individuals not willing or severely ill were excluded from the study.

Sampling method

This study was conducted by house to house visit in the selected locality. Sampled population was taken equally among all the ten localities. From each of ten localities, sixty seven adults aged thirty years and above were surveyed. Individual below 30 years, and those who declined for informed consent or not available at home after repeated visits were excluded from the study. After selection of area, pencil was dropped and the direction of pencil pointing towards the house was chosen as first house and the next adjacent houses were visited continuously without leaving a single house until the desired number of study subjects was covered. In every house, there were two house visits carried out in each family. First to collect the information pertaining to socio-demographic characteristics and other factors associated with diabetes on pretested and pre designed questionnaire. Second visit was done on the next day early morning for doing fasting blood sugar of the study subject using glucometer. Every individual was be interviewed and general physical examination was done along with anthropometric measurements. This information will be filled on pretested and pre designed questionnaire and data was entered in Microsoft excel sheet and was analysed using Epi Info 7.

RESULTS

Prevalence of diabetes mellitus in the present study was found to be 13.1%. Among the total diabetics, 10% were known diabetics 3.1% were newly diagnosed diabetics.

Table 1: Distribution of DM among study population.

DM	Number	Percentage (%)
Known diabetic	67	10.0
Newly diagnosed diabetic	21	3.1
Total	88	13.1

Figure 1 shows the distribution of DM among study population in relation to blood sugar level. It was observed that among the study population 78.4% were having fasting blood glucose level within normal range while 8.5% were having impaired fasting glucose. 13.1% of study participants were diabetic with blood sugar level >125 mg/dl.

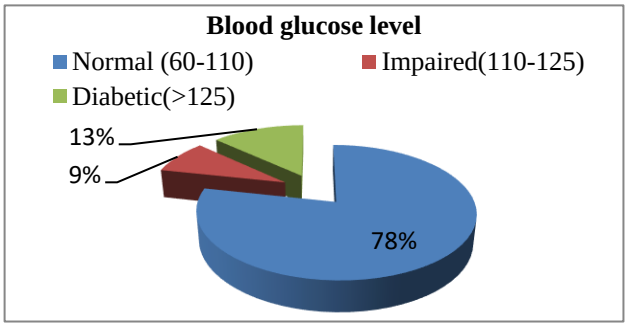

Figure 1: Distribution of DM among study population in relation to blood sugar level.

Prevalence of diabetes was reported to be higher among females (15.3%) as compared to males (11.2%). Maximum number of cases of diabetes were found among those who were graduate and above being 29% and 21% respectively. The prevalence of DM in relation to socio-demographic factors was found to be significantly associated with age, socio-economic status, educational status and marital status ($p<0.05$) while factors such as gender, religion, caste and type of family were found to be statistically insignificant (Table 2). Figure 2 shows that the risk factors like alcohol consumption, positive family history, smoking and hypertension are associated with diabetes.

Table 2: Socio demographic profile in relation to DM.

Variable	Total population		DM present		DM absent		Chi-square/p value
	No.	(%)	No.	(%)	No.	(%)	
Age group (years)							
30-39	310	46.3	16	5.2	294	94.8	
40-49	112	16.7	11	9.8	101	90.2	
50-59	114	17	18	15.8	96	84.2	X^2=63.604 P=0.00 Df=4
60-69	110	16.4	33	30	77	70	
70 and above	24	3.6	10	41.6	14	58.4	
Gender							X^2=2.34 P=0.12 Df=1
Male	363	54.2	41	11.3	322	88.7	
Female	307	45.8	47	15.3	260	84.7	
Educational status							
Illiterate	190	28.4	24	12.7	166	87.3	
Primary	80	11.9	11	13.7	69	86.3	
Middle	129	19.3	14	11	115	89	X^2=16.486 P=0.01 Df=6
High	74	11	9	12.2	65	87.8	
Intermediate/diploma	97	14.5	6	6.2	91	93.8	
Graduate	62	9.3	13	21	49	79	
Professors	38	5.6	11	29	27	71	
Socio-economic status							
Class I	65	9.7	13	20	52	80	
Class II	110	16.4	26	23.6	84	76.4	X^2=19.510 P=0.00 Df=4
Class III	269	40.2	31	11.5	238	88.5	
Class IV	154	10.7	7	9.7	65	90.3	
Class V	72	23	11	7.1	143	92.9	
Marital status							
Married	453	67.6	44	9.7	409	90.3	X^2=14.369 P=0.00 Df=2
Unmarried	174	26	35	20.1	139	79.9	
Separated/divorced	43	6.4	9	21	34	79	
Religion							
Hindu	455	68	53	11.6	402	88.4	X^2=5.824 P=0.543 Df=2
Muslims	164	24.5	23	14	141	86	
Others	51	7.5	12	23.5	39	76.5	
Caste							
General	169	25.2	27	16	142	84	X^2=4.16 P=0.12 Df=2
OBCs	372	55.5	40	10.7	332	89.3	
SC/ST	129	19.3	21	16.3	108	83.7	
Type of family							X^2=2.349 P=0.125 Df=1
Nuclear	168	25.1	27	16.1	141	83.9	
Joint	502	74.9	61	12.1	441	87.9	

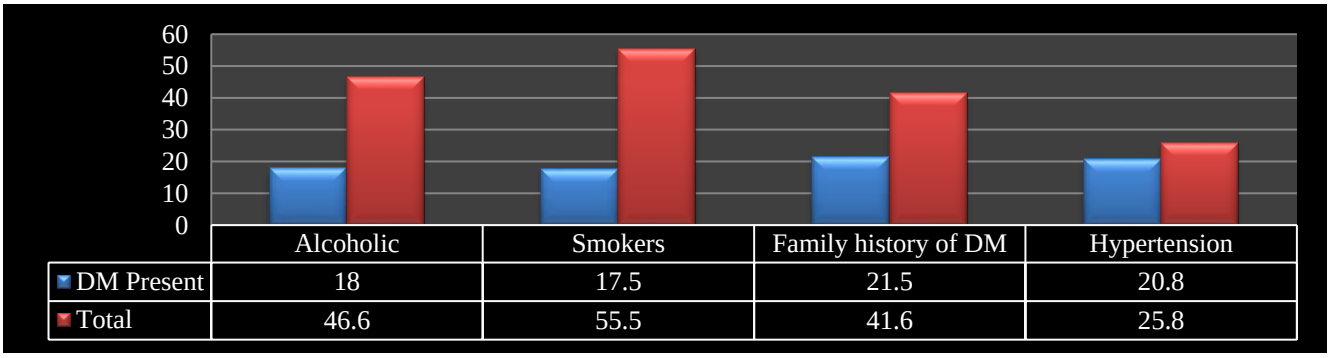

Figure 2: Association of risk factors with diabetes.

DISCUSSION

In the present study, prevalence of diabetes was found to be 13.1%. The findings were in line with the studies conducted by Bahl et al 15.6%, Kumar et al, Patil et al, and Sahile et al, in which prevalence of diabetes was 14.2%, 12%, 15.6%, 11.4%, 9.9% and 14.8% respectively.[5-8]

Increasing trend of DM was seen with the advancement of age. The high prevalence in older age groups could be attributed to poor immunity, stress and lesser physical activity. In age group of 70 years and above 41.6% were having diabetes followed by 60-69 years (30%). The prevalence was minimum in the age group 30-39 years 5.2%. This finding was also supported by the study done by Patil et al who reported the prevalence of diabetes increases as age increases, age 20-34 years: 1.66%, 35-49 years: 7.53%, ≥50 years: 15.66% and Arora et al who reported that with respect to age.[7,9]

Prevalence of diabetes was reported to be higher among females (15.3%) as compared to males (11.2%), but the difference was not found to be statistically significant. This may be because women's spend more time at home and they are not physically active like women. This finding was also supported by prevalence was slightly higher in women than in men Anjana et al.[10]

The prevalence of DM was found to be significantly associated with socio-economic status ($p<0.05$). The findings of the study were consistent with that of the study conducted by Kant et al in which prevalence of pre-diabetes and diabetes distribution was maximum in upper lower i.e. 18.53% and upper class i.e. 37.93% respectively.[11]

Bahl et al reported prevalence of diabetes 26.1% amongst educated up-to secondary class and just lowest 6.8% which is in illiterate group.[5] However, the findings were in contrast with Patil et al who reported higher prevalence of type 2 DM among primary education (28.57%) followed by secondary education 11 (26.19%) and illiterate 11 (26.19%).[7]

The prevalence of diabetes was more in widow/widower/separated or divorced population (20.9%). The findings of the study were consistent with that of the study conducted by Arora et al and Raman et al who reported prevalence of diabetes was highest in widows.[8,9]

CONCLUSION

In the present study, 13.1% of study participants were diabetic with. Increasing trend of DM was seen with the advancement of age. It was observed that person belonging to upper class and those who were educated intermediate and above were more diabetic, this may be probably due to their sedentary lifestyle. Risk factors like family history, hypertension and behavioural factors like alcohol consumption and smoking were associated with diabetes prevalence.

Recommendations

The present study reveals that among diabetics, 3.1% of the study subjects were newly diagnosed diabetics while 8.5% were having impaired fasting glucose. So, there is an urgent need for strategies to prevent or at least reduce the burden of the emerging epidemic of diabetes apart from treating diabetes and associated complications. More frequent screening camps of non-communicable diseases and information education and communication/behaviour change communication activities for life style modification should be undertaken by district and state health department and must be integrated with medical colleges.

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REFERENCES

1. Fauci A, Kasper D, Hauser S, Longo D, Loscalz J. Harrison's Principles of Internal Medicine 19th Edition and Harrison's Manual of Medicine 19th Edition. McGraw-Hill Education/Medical. 2017.
2. Reddy KS. Prevention and control of non-communicable diseases: status and strategies. New Delhi: Indian Council for Research on International Economic Relations. 2003. Available at: https://www.syndromic.org/storage/ documents/ NCDs/NCDStatusIndia2003_ SrinathReddy.pdf. Accessed on 11 January 2021.
3. Government survey found 11.8% prevalence of diabetes in India. 2019. Available at: https://www.livemint.com/science/health/governme nt-survey-found-11-8-prevalence-of-diabetes- in-india-11570702665713.html. Accessed on 11 January 2021.
4. Kannan R. India is home to 77 million diabetics, second highest in the world. The Hindu. Available at: https://www.thehindu.com/sci-tech/health/india-has-second-largest-number-of-people-with-diabetes/ article29975027.ece. Accessed on 11 January 2021.
5. Bahal SP, Saxena S, Srivastava A. Correlates of type-2 diabetes mellitus in urban slums population Moradabad. Int J Comm Med Public Health. 2018;5(6):2425-30.
6. Subramani SK, Yadav D, Mishra M, Pakkirisamy U, Mathiyalagen P, Prasad GBKS. Prevalence of Type 2 Diabetes and Prediabetes in the Gwalior-Chambal Region of Central India. Int J Environ Res Public Health. 2019;16:4708.
7. Patil R, Gothankar J. Risk factors for type 2 diabetes mellitus: An urban perspective. Indian J Med Sci. 2019;71(1).
8. Sahile AT, Bekele GE. Prevalence of Diabetes Mellitus and Associated Factors in Addis Ababa

Public Health Facilities, Addis Ababa, Ethiopia, 2016. Diabetes Metab Syndr Obes. 2020;13:501-8.
9. Arora I, Singh S, Bhuwal PK, Singh S. Prevalence of diabetes mellitus and its associated risk factor assessment among elderly in urban area of Punjab. Int J Comm Med Public Health. 2019;6(2).
10. Arora V, Malik JS, Khanna P, Goyal N, Kumar N, Singh M. Prevalence of Diabetes in urban Haryana. AMJ. 2010;3(8):488-94.
11. Anjana RM, Deepa M, Pradeepa R, Mahanta J, Narain K, Das HK, et al. Prevalence of diabetes and prediabetes in 15 states of India: results from the ICMR-INDIAB population-based cross-sectional study. Lancet Diabetes Endocrinol. 2017;5(8):585-596.
12. Jha KM, Kumar A, Kumar H, Lal PK, Roy V, Roy DC. A study on prevalence of maturity onset diabetes mellitus and its risk factors among urban adults of Darbhanga town, Bihar. 2018;3(1):1-3.
13. Arora V, Malik JS, Khanna P, Goyal N, Kumar N, Singh M. Prevalence of Diabetes in urban Haryana. AMJ. 2010;3(8):488-94.
14. Raman PG. Epidemiology of Diabetes mellitus. Diabetes Mellitus. 2000;15-23.

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