Research Article

Study on risk factors of diabetes mellitus among residents of an urban field practice area of Kurnool Medical College

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Received February 1, 2015. Accepted February 8, 2015

Abstract

Background: Diabetes mellitus (DM) is an iceberg-like disease. It remains undetected being generally asymptomatic during most of its course. As it is hidden beneath the outward asymptomatic appearance, the disease does immense harm to the body.

Objective: 1.To reveal the prevalence of DM among residents in urban field practice area. 2. To study the association of risk factors with DM.

Material and Methods: It was a community-based cross-sectional house-to-house study conducted in an urban-field practice area of Kurnool Medical College. A pretested semistructured questionnaire was used. A total of 630 study subjects aged above 15 years belonging 189 houses participated in the study. Information was collected about their age, sex, education, occupation, socioeconomic status, and habits such as smoking, betel-nut chewing, alcohol intake, and dietary pattern. Their height and weight were measured and body mass index (BMI) was calculated. Blood pressure and blood sugar levels of the subjects were measured. χ^2-Test was used to test the significance.

Result: The prevalence of DM among the study population was found to be 12.8%. DM was found to be significantly associated with age, literacy status, BMI, alcohol consumption, blood pressure, and amount of physical inactivity.

Conclusion: Considering the high prevalence of DM among the study population, necessary preventive and corrective measures needs to be promoted. This study indicates the importance of including persons with risk factors such as physical inactivity, overweight and obesity, alcohol intake, hypertension, and smoking in the community, and the need for planning intervention programs that include dietary modification, control of risk factors, regular exercise, initiating the appropriate treatment and avoiding the complications.

KEY WORDS: Diabetes mellitus, risk factors, physical activity

Introduction

Diabetes mellitus (DM) is an iceberg-like disease. It remains undetected being generally asymptomatic during most of its course. As it is hidden beneath the outward asymptomatic appearance, the disease causes immense harm to the body. DM is now a leading cause of morbidity and mortality throughout the world; it ranks 12th in mortality worldwide.[1] An estimated 171 million people worldwide have diabetes.[2] It is estimated that 20% of global burden of DM resides in South East Asia Region (SEAR).[3] In India 66.58 million people have diabetes, and multicenter studies have shown the prevalence of diabetes as 5.4% in urban areas and 3.4% in rural areas in 2004. In Andhra Pradesh, the prevalence of diabetes is 14.1%.[4] DM is a multifactorial disease and the main risk factors include modifiable variables such as BMI, physical inactivity,

Access this article online	
Website: http://www.ijmsph.com	Quick Response Code:
DOI: 10.5455/ijmsph.2015.01022015199	

diet, infections, and nonmodifiable variables such as age, family history of DM.[5] As there is change in the life-style of people, which makes them more prone to non-communicable diseases such as diabetes, we conducted this study.

Objective

1. To show prevalence of DM in the age group of 15 years and above in urban field practice area of Kurnool Medical College.
2. To study the association of risk factors with DM in the subjects in the age group of 15 years and above in an urban field practice area of Kurnool Medical College.

Materials and Methods

This was a community-based cross-sectional study conducted in the Sriramnagar, an urban field practice area of Kurnool Medical College, during September 2012 to October 2012.

Using simple random sampling, we identified houses for the study. A house-to-house visit was made and persons of both the sexes aged 15 years and above were interviewed using a predesigned semi-structured questionnaire.

A total of 630 study subjects from 189 houses participated in this study (p = 1 4.1%, l = 20% of p). Informed consent from the participants, permission from the college authorities, and also ethical clearance were obtained and confidentiality of the participants' data was maintained. Information was collected about their age, sex, education, occupation, socio-economic status, and habits such as smoking, betel-nut chewing, alcohol intake, and dietary pattern. Their height and weight were measured and body mass index (BMI) was calculated. Blood pressure (BP) was measured with a sphygmomanometer in sitting position on right arm and BP >140/90 mm Hg was considered as hypertension. Blood sugar was measured with a glucometer and level >200 mg/dl was considered as denoting diabetes. Statistical analysis was carried out with Epi Info 7 software.

The study area comprised 2146 houses and a population of 6102. Most of the houses were pukka and semi-pukka. Majority of the houses had protected water supply, and majority of the women were using community latrines and men were practicing open-field defecation. Very few houses had sanitary latrines. Most of them are either unskilled or semiskilled laborers. Literacy rate among men was found to be 66% and among women 48%.

Result

It is from Table 1 that a majority of diabetic subjects belonged to the age group of >55 years (18.7%). Among them, 13.5% patients with diabetes belonged to 36–55 years and 3% belonged to 15–35 years age group. This difference was statistically significant.

Table 1: Age distribution of the study population

Age group	Diabetic (%)	Nondiabetic (%)	Total (%)
15–35	4 (3)	124 (97)	128 (100)
36–55	44 (13.5)	282 (86.5)	326 (100)
>55	33 (18.7)	143 (81.3)	176 (100)
Total	81 (12.8)	549 (87.2)	630 (100)

χ^2:16.35, df:2, $P < 0.05$

Table 2: Sex distribution of study population

Sex	Diabetic (%)	Nondiabetic (%)	Total (%)
Male	43 (14.5)	253 (85.5)	296 (100)
Female	38 (11.3)	296 (88.7)	334 (100)
Total	81	549	630

χ^2:1.38, d.f:1, $P > 0.05$

Table 3: Relation between diabetes and education

Education	Diabetic (%)	Nondiabetic (%)	Total
Illiterates	43 (8.81)	445 (91.19)	448
Literates	38 (26.76)	104 (73.24)	142
Total	81	549	630

χ^2:31.62, d.f:1, $P < 0.05$

Table 4: Relation between diabetes and occupation

Occupation	Diabetic (%)	Nondiabetic (%)	Total
Professional	14 (22.4)	48 (77.6)	62
Nonprofessional	67 (11.7)	501 (88.3)	568
Total	81	549	630

χ^2:5.83, d.f:1, $P < 0.05$

Table 5: Relation between diabetes and socioeconomic status

SES	Diabetic (%)	Nondiabetic (%)	Total (%)
APL	19 (17.8)	87 (82.2)	106
BPL	62 (11.8)	462 (88.2)	524
Total	81	549	630

χ^2: 2.92, d.f:1, $P > 0.05$

It is observed from Table 2 that a majority of diabetic subjects were male (14.5%) as compared to female (11.3%). This difference was not statistically significant.

It is observed from Table 3 that diabetes was more common in literate individuals (26.76%) as compared to illiterate individuals (8.81%). This difference was statistically significant.

It is observed from Table 4 that diabetes was more common in professionals (22.4%) compared to nonprofessionals (11.7%). This difference was statistically significant.

Table 6: Relation between diabetes and BMI

BMI	Diabetic (%)	Nondiabetic (%)	Total (%)
<22.9	25 (6.5)	362 (93.6)	387
>23	56 (22.8)	187 (77.2)	243
Total	71	549	630

χ^2:36.4, d.f:1, $P < 0.05$

Table 7: Relation between diabetes and habits

Habits	Diabetic (%)	Nondiabetic (%)	Total	*P* value
Tobacco consumption				
Yes	10 (13.4)	66 (86.6)	76	>0.05
No	71 (12.7)	483 (87.3)	554	
Alcohol consumption				
Alcoholics	14 (24.4)	43 (75.6)	56	<0.05
Nonalcoholics	67 (11.6)	506 (88.4)	573	
Dietary pattern				
Nonvegetarian	68 (13.6)	431 (86.4)	499	>0.05
Vegetarian	13 (9.6)	118 (90.4)	131	

Table 8: Relation between diabetes and hypertension

	Diabetic (%)	Nondiabetic (%)	Total (%)
Hypertensive	52 (16.9)	254 (83.1)	306
Normotensive	29 (8.9)	295 (91.1)	324
Total	81	549	630

χ^2:9.08, d.f:1, $P < 0.05$

It is observed from Table 5 that majority of patients with diabetes belong to above the poverty line (17.8%) as compared to below the poverty line (11.8%). This difference is not statistically significant.

It is observed from Table 6 that majority of patients with diabetes belong to BMI >23 group (22.8%) as compared to BMI <22.9 group (6.5%). This difference is statistically significant.

It is observed from Table 7 that diabetes was more common in persons consuming tobacco (13.4%) compared to those not consuming tobacco (12.7%). This difference is not statistically significant. It is observed from the table that diabetes was more common in alcoholics (24.4%) compared to nonalcoholics (11.6%). This difference was statistically significant. It is also observed that diabetes was more common in nonvegetarians (13.6%) compared to vegetarians (9.6%). This difference is not statistically significant.

It is observed from Table 8 that a majority of patients with diabetes are also hypertensive (16.9%) compared to normotensives (8.9%). This difference is statistically significant.

Discussion

In this study, the prevalence of diabetes was significantly higher among individuals in > 55 years age group. Similar results were observed in a study conducted by Majgi et al.[4] Prevalence of diabetes was more common in individuals >50 years of age (27.5% prevalence in individuals >50 years of age). Diabetes prevalence was high in male population. This result contradicted that reported in studies conducted by Majgi et al.[4] and Singh et al.[6] (female population had high prevalence). This study shows the prevalence of diabetes was significantly more common in literates, and this result was similar to that reported in the study conducted by Majgi et al.[4] Diabetes was more among professional groups. The prevalence was also higher among above-the-poverty-line group. Similar result was observed in the study conducted by Majgi et al.[4] (more common in class V). This study shows diabetes was more common in population with BMI >23 kg/m^2 and this was similar to that in studies conducted by Majgi et al.,[4] Gupta et al.,[3] and Prabhakaran et al.[7] Diabetes was found to be significantly associated with hypertension.

Limitations: Owing to financial constraints, further investigations such as oral glucose tolerance and glycosylated hemoglobin tests could not be carried out.

Conclusions

Considering the high prevalence of DM among the study population, necessary preventive and corrective measures need to be promoted. This study indicates the importance of including persons with risk factors such as physical inactivity, overweight and obesity, alcohol intake, hypertension, and smoking in the community, and the need for planning intervention programs that include dietary modification, control of risk factors, regular exercise, and initiating the appropriate treatment and avoiding the complications.

Recommendations

1. Measures should be taken to prevent the emergence of modifiable risk factors of DM at school level.
2. Individuals should engage in adequate levels of physical activity throughout their lives. Engaging in daily moderate physical activity for at least 30 min is needed.
3. Professional groups are encouraged to move toward a healthy lifestyle.
4. Awareness of community regarding risk factors of diabetes and their prevention through information, education, and communication (IEC) activities should be improved.
5. Screening for DM of all persons above 30 years in health centers should be done.
6. Patients with diabetes must also be screened for other comorbid conditions like hypertension.

Acknowledgments

1. Principal, Kurnool Medical College, Kurnool
2. Dr. Mahaboob Basha, DMHO office
3. Faculty, PGs, and house surgeons (G. Mounika, K. Prabhavathi, J. Padmalatha, and R. Sharmila) of Department of Community Medicine, Kurnool Medical College.
4. Study participants of Sriramnagar.

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How to cite this article: Rao GV, Sreedevi A. Study on risk factors of diabetes mellitus among residents of an urban field practice area of Kurnool Medical College. Int J Med Sci Public Health 2015;4:969-972

Source of Support: Nil, **Conflict of Interest:** None declared.