SOCIO-DEMOGRAPHIC VARIABLES AND RISK FACTORS OF TYPE 2 DIABETES AMONG URBAN RAJAHMUNDY POPULATION

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ABSTRACT

BACKGROUND

In recent times diabetes has taken an epidemic form, having been seen in younger age group as well as in elderly. This may be due to improved nutritional status and decreased physical activity.

The objective of the study is to record the socio-demographic variables and risk factors of diabetes in urban areas of Rajahmundry, East Godavari district, Andhra Pradesh.

MATERIALS AND METHODS

A descriptive study was conducted from September 2015 to March 2016 for a period of 6 months in individuals of age ranging from 25 years to 80 years, who were either diabetic or non-diabetic among urban population of Rajahmundry, East Godavari district of Andhra Pradesh.

RESULTS

In our study population of 100 patients, male and female were 43 and 57 respectively with male-to-female ratio of 1: 1.3. The prevalence of diabetes was 21% in this study. Highest number of diabetics was found in the age group of 45 - 54 years. 52 out of 57 females were housewives, 2 were lecturers and 3 were daily labourers. Most of the males (22) were daily labourers. 64 subjects belonged to middle income group, 34 were of low-income group and 2 were of high-income group. 13 were habituated to smoking and 10 were alcoholic. 31 individuals were hypertensive among the study population.

CONCLUSION

Occupation, literacy, socio-economic status, hypertension, diet and exercise play a crucial role in the prevalence of the fast-growing non-communicable disease such as diabetes.

KEY WORDS

Diabetes, Hypertension, Occupation, Literacy, Diet.

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BACKGROUND

India being proud as the developing nation is facing a huge challenge in the form of growing prevalence of non-communicable diseases such as diabetes, hypertension, overweight and obesity. In the recent years, there is an increasing burden of diabetes in India. According to many studies India had been projected as the future capital of diabetes, which throws a threat to nation. In recent times, diabetes has taken an epidemic form resulting in presentation in younger age group as well as in elderly due to improved nutritional status and decreased physical activity.

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With an increase in elderly population, there is proportionate increase in the prevalence of elderly individuals with diabetes. Diabetes complications involve all major vital organs of the body at some point during the course of the disease. Among the comorbidities, Hypertension (41.9%) and cardiovascular disease (28.1%) were relatively higher in elderly diabetics.^[1] The Inter-Heart study showed that population attributable risk of acute myocardial infarction due to known diabetes was 10%, implying that it is a major factor of risk.^[2] The prevalence of coronary artery disease was 21.4% among diabetic subjects compared to 9.1% in subjects with normal glucose tolerance.^[3]

Occupation, literacy, diet, habituations such as smoking and alcohol consumption play a crucial and pivotal role in the development of diabetes and progress of the disease.^[4] Nowadays, diet had become a major issue in the increasing prevalence of diabetes. With the growing technology and a sedentary lifestyle, many individuals are becoming overweight or obese. In North America and Europe, there is a growing trend of obesity from childhood because of the dietary habits and the availability of resources in technology added with lifestyle changes.^[5] All these play an important role in the early onset of diabetes.

In India, especially metro and the urban localities, there is an increasing prevalence and incidence of diabetes and hypertension, which has been evident in many publications and the recent national health census. This may be because of the migration, urbanisation and industrialisation.^[6] Nowadays, there is an increasing availability of completely processed food in India as in western worlds, which might also be a factor for the increasing pace of non-communicable diseases. Indians are genetically predisposed for coronary artery disease due to lipid abnormalities.^[7]

As we all know literacy plays an important role in the development of the nation, but because of sedentary occupation and decreasing exercises, we are racing towards non-communicable diseases along with the developing economy. Availability of junk food and high calorie diet is also an important factor.^{[8],[9],[10]}

Objective of the study was to conduct and record the socio-demographic variables and the risk factors of diabetes in urban Rajahmundry, East Godavari district of Andhra Pradesh.

MATERIALS AND METHODS

This is a descriptive study. Required sample size was calculated by using the formula " $n = 4 \times P \times Q / L \times L$," where P is unknown prevalence and it was considered as 50%. L is 20% allowable error of unknown prevalence (50%) and then sample size was 100. Sampling method adopted was purposive sampling. Complete and relevant history was taken, history regarding drugs usage, alcohol, smoking and dietary habits were recorded and systolic and diastolic blood pressures were noted and subjected to investigations such as fasting and post-prandial blood sugars, to diagnose the individual as Diabetic according to WHO and ADA guidelines.

Study included all individuals ranging from age of 25 years to 80 years, who were either known diabetic or non-diabetic and subjected to investigations. Known diabetic was defined as an individual who had been diagnosed as diabetic in the past and presently using medications. The comatose patients and severely ill patients are not included in the study. Individuals suffering from other endocrine diseases and secondary hypertension are not included. The details collected are captured in a Master Chart and analysed.

All statistical analyses were done by using SPSS Software version 21.0 and MS Excel 2007. Descriptive statistical data was presented as mean $\pm$ standard deviation and percentages. Chi-square test was performed to assess the association among various categorical variables. For all statistical analysis, $p < 0.05$ was considered as statistically significant.

RESULTS

Study was conducted in urban areas of Rajahmundry, East Godavari district, Andhra Pradesh with 100 individuals, who are selected over a period of 6 months. In this study, 43 are males and 57 are females. Highest age was 76 years. Male-to-female ratio was 1: 1.3. Mean age of the study population was 46.41 ± 11.35 years. The mean age of diabetic individuals was 44.47 ± 10.98 years.

The prevalence of diabetes in our population was 21%; 13 individuals are smokers and 10 individuals are alcoholic. The study population was divided into 4 groups of non-diabetic non-hypertensive (NDNH), diabetic hypertensive

(DH), diabetic non-hypertensive (DNH) and non-diabetic hypertensive (NDH) (Table 01).

The individuals included in the study were of various occupations including agricultural labourers, business, daily labourers, driver, electrician, government job, junior assistant, lecturer, private employee, student and housewives. 52 out of 57 females were housewives, 2 were lecturers and 3 were daily labourers. Most of the males (22) were daily labourers. The individuals of various professions were shown in Table 02. There was no statistical significance found between various professions and diabetes in our study.

64 subjects belonged to middle income group, 34 of low-income group and 2 were of high income group (Table 03). Statistical significance was not found between diabetes and various income groups. The mean pulse rate of the study population was 81.27 ± 9.22 per minute. The mean systolic blood pressure of the study population was 121.73 ± 16.95 mmHg and diastolic blood pressure was 80.24 ± 7.69 mmHg.

The mean height of the study population was 158.44 ± 9.09 centimetres (cms). The mean weight of the study population was 63.97 ± 11.91 kilograms (kg). The mean waist circumference of the study population was 11.91 ± 13.82 cm. The mean body mass index of the study population was 25.55 ± 4.92 kg/sq.m.

7 out of 13 smokers were diabetic and 5 were hypertensive. 3 smokers were non-diabetic and non-hypertensive. Smoking was found to be significantly associated with diabetes and hypertension. 5 out of 10 alcoholics were diabetic and 4 were hypertensive. 2 alcoholics were non-diabetic and non-hypertensive. Alcohol was found to be significantly associated with diabetes and hypertension (Table 01).

In our study 28 individuals were consuming fruits daily, whereas 43 were consuming once or twice in a week and 29 were rarely consuming fruits. 03 individuals out of 28 who were daily consuming fruits were diabetic. 04 out of 43 who were weekly consuming fruits were diabetic. 14 out of 29 who rarely consumed fruits were diabetic. Diabetes was found to be positively correlated with less amount of fruits intake. There was a significant association found between higher amount of fruit intake and lesser incidence of diabetes.

	Total	NDNH	DH	DNH	NDH	
Sex						
Male	43	23	10	3	7	
Female	57	39	6	2	10	0.264
Age						
25-44 years	43	31	7	2	3	
45-64 years	50	29	8	3	10	
64-80 years	7	2	1	0	4	0.062
Occupation						
House wife	52	36	5	2	9	
Daily labourer	25	17	5	1	2	
Other occupations	23	9	6	2	6	0.192
Socio-Economic Status						
Middle income group	64	40	9	3	12	
Low income group	34	22	5	2	5	
High income group	2	0	2	0	0	0.088
Fruits						
Daily	28	22	2	1	3	

Weekly	43	33	3	1	6	
Rarely	29	7	11	3	8	0.001
Smoking	13	3	5	2	3	
Non-Smokers	87	59	11	3	14	0.008
Alcohol	10	2	4	1	3	
Non-Alcoholics	90	60	12	4	14	0.032

Table 1. Distribution of Type 2 Diabetes and Hypertension according to Age, Gender, Occupation, Smoking, Alcohol and Intake of Fruits

Occupation	Frequency	Percent
Agricultural labourer	1	1
Business	4	4
Daily labourer	25	25
Driver	3	3
Electrician	5	5
Government employee	3	3
Housewife	52	52
Jr. Asst.	2	2
Lecturer	2	2
Private employee	1	1
Student	2	2
Total	100	100

Table 2. Occupation of the Study Subjects

Socio-Economic Status	Frequency	Percent
Middle income group	64	64
Low income group	34	34
High income group	2	2
Total	100	100

Table 3. Distribution of Socio-Economic Status in the Study Population

DISCUSSION

Socio-demographic variables such as occupation, literacy, socio-economic status, food habits and lifestyle play an important role in the prevalence of diabetes and hypertension. The aetiology of diabetes is multi-factorial. Diabetes should not be considered as a professional illness. In many cases because of long working hours, shift duties and stress these people become more prone to non-communicable diseases, especially diabetes and hypertension.^[11] In our study, most of the females were housewives and males were daily wage labourers. There was no significant relation found between occupation and diabetes in the present study. There are many studies in India and abroad, some show positive correlation and some do not between occupation and diabetes.^{[12],[13],[14],[15]}

The allocation of health resources between various groups of people in society is disproportionate. There is wide variation of health awareness between various income groups and as well between various educational qualifications. There are various studies which showed inverse or direct relation between diabetes and household income.^{[16],[17]} In the present study, no significant association was found between various income groups and diabetes.

Hypertension and diabetes are non-infectious diseases which are interrelated and had got a lot of significance. The prevalence of high blood pressure was 32.81% in middle income group and 29.41% in low income group. There are studies which have shown no relationship between socio-economic status in association between hypertension and diabetes.^[18]

Diabetes along with other non-communicable diseases is found to have a significant relation with the quantity, quality and nature of food which we consume. In our study, we have found a significant correlation between daily fruit intake and prevalence of diabetes. In our study, it was interestingly found that people who had a daily fruit intake had lesser prevalence of diabetes than who had a weekly and rare fruit intake.

Certain limitations are present in our study. Small sample size and recall bias form part of these limitations. Larger sample size is needed to generalise the findings in a larger perspective. The studies undertaken are also prone to potential error, because of heterogeneity of the Indian population with respect to culture and ethnicity.

CONCLUSION

Occupation, literacy, socio-economic status, diet and exercise play a crucial role in the prevalence of the fast-growing non-communicable disease such as diabetes. Precautions which include lifestyle modifications, regular exercises and dietary habits need to be reviewed at regular time intervals. The potential catastrophic increase in diabetes at young age needs to be addressed. Further studies are required to provide more complete understanding of the differences in diabetes in relation to cultural and ethnic trends.

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