

AN EPIDEMIOLOGICAL STUDY OF DIABETES MELLITUS AMONGST HIGH RISK AGE GROUP POPULATION IN URBAN AND RURAL AREAS OF KANPUR

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Abstract :

Research Question : - What is the magnitude of Diabetes mellitus in the urban and rural areas of Kanpur.

Objectives :

1. To study the prevalence of diabetes mellitus amongst high risk age group population in urban and rural areas of Kanpur.
2. To compare the magnitude of problem of diabetes mellitus between urban and rural areas of Kanpur.
3. To study the possible associates and socio-demographic variables related to diabetes mellitus.

Study Design : Cross sectional study.

Setting : The study was performed on three thousand population each in urban and rural areas of Kanpur.

Participants : High risk age group population i.e. 45 years and above.

Study variables : Age, Sex, impaired glucose tolerance, Body mass index, Education, Working status, Social class, family history of diabetes.

Statistical analysis : Chi-square test, percentages

Results :- From a total of 676 persons of high risk age group i.e. 45 years and above, the overall prevalence of diabetes mellitus in the study areas was observed to be 7.1% with 9.94% in urban and 3.61% in rural areas. the maximum percentage of diabetes cases (41.66%) was in the age group of 56-60 years. Higher prevalence of diabetes was observed in the obese (56.25%) and sedentary (87.5%) persons. The family history of diabetes mellitus was present in (35.41%) of diabetes mellitus cases.

Introduction :

'Diabetes mellitus' is a disease known from ancient times. Around 500 AD in Indian Vedic literature this disorder was recognised as 'Madhumeha' meaning 'honey-urine'. It is a syndrome characterized by chronic hyperglycemia and disturbances of carbohydrate, fat and protein metabolism associated with absolute or relative deficiencies in insulin secretion and/or insulin action.

WHO (1985)¹ reported that the characteristic symptoms of diabetes mellitus are excessive thirst, polyuria, polyphagia, pruritus and unexplained weight loss, or may be as symptomatic till complications present themselves. Quite often, diabetes is discovered because of an abnormal result of a routine blood or urine glucose test.

The revised criteria for diagnosing diabetes mellitus issued by National Diabetes Data Group and World Health Organization.

Symptoms of diabetes plus random blood glucose concentration ≥ 200 mg/dl. Or fasting plasma glucose concentration ≥ 126 mg/dl. Or

Two hours plasma glucose ≥ 200 mg/dl during an Oral glucose tolerance test.

(Source : Adapted from American Diabetes Association, 2000)²

Type 2 diabetes is a modern age epidemic and estimated to affect 150 million people world wide. It is projected that the disease prevalence will be 5.4% by the year 2025, with global diabetic population reaching 300 million.³

In India presently 19.4 million individuals are affected by this deadly disease, which is likely to go up to 57.2 million by the year 2025³.

High prevalence is reported particularly from urban areas⁴. The reasons for this escalation are due to changes in lifestyle, people living longer than before (ageing), high genetic predisposition, associated stress of rapid urbanization, and intake of ill balanced diet with high amounts of refined carbohydrates and dietary fats.

Kanpur, a city of multicultural complex, consists of population of all social strata of life., facing hazards and stress of urban life. This aroused my zeal and enthusiasm to conduct the present study in urban and rural areas of Kanpur.

Material & Methods :

The present study was conducted amongst the individuals of high risk age group population in the urban and rural areas of Kanpur. In this study three thousand population each in urban and rural areas of Kanpur was surveyed by selective screening epidemiological research technique to cover high risk age group population i.e. 45 years and above as per (ADA criteria 2000)². Though there are a few limitations of this approach, but due to intervention of huge number of people an approximation is quite reliable. Survey was conducted by house to house contact. The high risk age group persons were identified for detailed interviews and investigations and the detailed information was collected on a predesigned and pretested proforma.

The target individuals of high risk age group were requested for urine sample two hours after taking meal/ breakfast. Screening was conducted by urine examination with the help of DIASTIX. The urine positive individuals were considered as SUSPECTS and these suspects were further approached for confirmation of diagnosis by post-prandial blood glucose test i.e. by taking blood sample two hours after meal with the help of GLUCOMETER as per WHO criteria (1985)¹, to establish them as CASE. The data in examinations

and investigations was analyzed by using various relevant techniques of biostatistics.

Observation & Discussion :

Table-I shows that of the total 676 high risk age group study population the overall prevalence of diabetes mellitus was observed to be 7.1% with 9.94% in urban areas and 3.61% in rural areas. this correlates with the studies done by Ramachandran et al (1992)⁵ which showed a prevalence of 8.2% in urban areas and 2.4% in rural areas of Chennai. A recent national population based study conducted in six urban cities reveals the prevalence of diabetes in Chennai to be 13.5% Bangalore - 12.4%, Hyderabad 16.6%, Calcutta 11.7%, New Delhi 11.6% and Mumbai 9.3%.

Table-II shows that the maximum percentage of diabetes cases (41.66%) was in the age group of 56-60 years. In the present study the percentage of male diabetics (58.33%) was more compared to female diabetics (41.66%).

Table-III shows the distribution of diabetes cases according to their body mass index and it was observed that the majority of diabetic cases were obese (56.25%), (29.16%) were overweight and (14.58%) were normal. It correlates with the study done by Westland, K et al (1972)⁶ which reveals that the incidence of diabetes is increased about fourfold in persons with moderate obesity and thirty fold in those with severe obesity.

Table-IV shows the distribution of diabetes cases according to their working status and it was observed that in both urban and rural areas, (87.5%) of diabetes were engaged in sedentary work, (12.5%) were moderate workers and none was a heavy worker. This correlates with the study done by Yagnik CS et al (2001)⁷ which revealed that the rise in diabetes prevalence was due to adoption of sedentary lifestyle.

Table-V shows that the family history of diabetes mellitus was present in 35.41% of diabetes cases whereas 64.58% of diabetes did not show a

positive family history. It correlates with the studies done by Vishwanathan M, Snehlata et al (1996)⁸ which revealed that the prevalence of diabetes among offspring with one diabetes parent was 36% and it

increased to 54% with a positive family history of diabetes also on the non-diabetic parental side. The prevalence rate (62%) and risk (73%) increased further when both parents had diabetes.

TABLE - I : SEX WISE PREVALENCE OF DIABETES MELLITUS CASES IN URBAN AND RURAL AREAS OF KANPUR

	Urban			Rural			Grand
	Males (n=210)	Females (n=162)	Total (n=372)	Males (n=176)	Females (n=128)	Total (n=304)	Total (n=676)
	no.	no.	no.	no.	no.	no.	no.
	%	%	%	%	%	%	%
Diabetes mellitus cases	22 (10.47)	15 (9.25)	37 (9.94)	6 (3.40)	5 (3.90)	11 (3.61)	48 (7.10)
Non-diabetics	188 (89.52)	147 (90.74)	335 (90.05)	170 (96.59)	123 (96.09)	293 (96.38)	628 (96.89)

X² 10.15

d.f. 1

p < 0.05 highly significant

TABLE - II : AGE AND SEX WISE DISTRIBUTION OF DIABETES MELLITUS CASES IN URBAN AND RURAL AREAS OF KANPUR.

Age Group (yrs.)	Urban			Rural			Grand Total
	Male no. %	Female no. %	Total no. %	Male no. %	Female no. %	Total no. %	
45-50	3 (13.63)	2 (13.33)	5 (13.51)	0 (0.0)	0 (0.0)	0 (0.0)	5 (10.41)
51-55	2 (9.09)	4 (26.66)	6 (16.21)	1 (16.66)	1 (20.0)	2 (18.18)	8 (16.66)
56-60	9 (40.90)	5 (33.33)	14 (37.83)	3 (50.0)	3 (60.0)	6 (54.54)	20 (41.66)
61-65	4 (18.18)	2 (13.33)	6 (16.21)	1 (16.66)	1 (20.0)	2 (18.18)	8 (16.66)
66-70	3 (13.63)	0 (0.0)	3 (8.10)	0 (0.0)	0 (0.0)	0 (0.0)	3 (6.25)
71-75	1 (4.54)	1 (6.66)	2 (5.40)	0 (0.0)	0 (0.0)	0 (0.0)	2 (4.16)
>=76	0 (0.0)	1 (6.66)	1 (2.70)	1 (16.66)	0 (0.0)	1 (9.09)	2 (4.16)

TABLE - III : DISTRIBUTION OF OBESITY AND OVERWEIGHT IN DIABETES MELLITUS CASES IN URBAN AND RURAL AREAS OF KANPUR.

Body Mass Index (BMI) Kg/m2 categories	Urban			Rural			Grand Total
	Male	Female	Total	Male	Female	Total	
	no.	no.	no.	no.	no.	no.	
	%	%	%	%	%	%	
Normal	3 (13.63)	2 (13.33)	5 (13.51)	1 (16.66)	1 (20.0)	2 (18.18)	7 (14.58)
Overweight	7 (31.81)	3 (20.0)	10 (27.02)	2 (33.33)	2 (40.0)	4 (36.36)	14 (29.16)
Obese	13 (59.09)	9 (60.0)	22 (59.45)	3 (50.0)	2 (40.0)	5 (45.45)	27 (56.25)
Total	23	14	37	6	5	11	48

TABLE - IV : DISTRIBUTION OF DIABETES MELLITUS CASES AS PER THEIR WORKING STATUS IN URBAN AND RURAL AREAS OF KANPUR

Working Status	Urban			Rural			Grand Total
	Male	Female	Total	Male	Female	Total	
	no.	no.	no.	no.	no.	no.	
	%	%	%	%	%	%	
Sedentary	18 (81.81)	15 (100.0)	33 (89.18)	5 (83.33)	4 (80.0)	9 (81.81)	42 (87.50)
Moderate	4 (18.18)	0 (0.0)	4 (10.81)	1 (16.66)	1 (20.0)	2 (18.18)	6 (12.50)
Heavy	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Total	22	15	37	6	5	11	48

TABLE - IV : DISTRIBUTION OF DIABETES MELLITUS CASES AS PER FAMILY HISTORY IN URBAN AND RURAL AREAS OF KANPUR

	Urban			Rural			Grand Total
	Male	Female	Total	Male	Female	Total	
	no.	no.	no.	no.	no.	no.	
	%	%	%	%	%	%	
Family History Present	8 (36.36)	7 (46.66)	15 (40.54)	1 (16.66)	1 (20.0)	2 (18.18)	17 (35.41)
Family History Not present	14 (63.63)	8 (53.33)	22 (59.45)	5 (83.33)	4 (80.0)	9 (81.81)	31 (64.58)
Total	22	15	37	6	5	11	48

Conclusion and Recommendation :

Thus, it can be concluded from the present study that the problem of diabetes mellitus is almost twice as prevalent in urban areas as compared to rural areas. The maximum prevalence of diabetes mellitus in both urban and rural areas was observed to be in the age group of 56-60 yrs. In the study population majority of those with obesity and sedentary lifestyle were prone for diabetes mellitus.

So, specially in the urban areas, high risk age group population should be screened out and investigated for diabetes mellitus and lifestyle changes should be encouraged.

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