

A STUDY ON PREVALENCE OF DM, HYPERTENSION AND ASSOCIATION WITH LIFE STYLE AS RISK FACTORS IN A RURAL POPULATION DISTRICT GHAZIABAD (U. P.)Narendra Singh¹, A. K. Dixit²**HOW TO CITE THIS ARTICLE:**

Narendra Singh, A. K. Dixit. "A Study on Prevalence of DM, Hypertension and Association with life Style as Risk Factors in a Rural Population District Ghaziabad (U. P.)". Journal of Evolution of Medical and Dental Sciences 2014; Vol. 3, Issue 69, December 11; Page: 14811-14817, DOI: 10.14260/jemds/2014/3989

ABSTRACT: BACKGROUND & OBJECTIVE: Estimation of rising prevalence of Diabetes Mellitus, Hypertension, Obesity etc & association with various risk factors is having bearing on effective preventive programmes. Cross sectional study was conducted in rural population in a health centre to assess prevalence of DM, Hypertension, and association with their life style if any. **METHODS:** Pretested proforma administered to all males 35 -50 yrs age coming to a health Centre. Information on diets, habits, physical activity, medical & family history, height, weight, blood pressure, blood sugar level was taken. For data analyses epi info software used. **RESULTS:** Out of 1120 participants, 186 were having Hypertension, prevalence of 16.87%, 14 hypertensive, (7.53 %) with positive family history of hypertension. 89 were Diabetic, prevalence of 7.94 %. In this group, 7 (7.90%) had family history of diabetes. Overall 258 (25.03%) had abnormal BMI, age group with highest BMI as risk factor, had higher hypertensive & Diabetics persons, most of them consuming non-vegetarian diet with saturated fats. Most of participants were doing mild to moderate physical activity. **INTERPRETATION & CONCLUSIONS:** The study provides insight on high burden, of Hypertension, Diabetes Mellitus, and the associated risk factors in a rural population in a health Centre. Life style modifications, more physical activity, lesser intake of non-vegetarian items, fats, salt in the diet, will result in lesser risk & load of these diseases.

KEYWORDS: Life style diseases, Hypertension, Diabetes Mellitus, Rural population.

INTRODUCTION: As per Diabetes Atlas 2013 of IDF, diabetics in India are currently 65.1 Millions, 2nd highest in world, prevalence 9.1%, may increase to 120 million, (Prevalence 10.1%) by 2035. Initially an urban epidemic, diabetes is becoming a major health concern in rural communities in low, middle-income countries.¹

Indians have increased insulin resistance, greater abdominal adiposity, changes in dietary patterns and decreased physicals. Younger diabetics are, causing adverse effects on nation's health and economy² with 23.5% world's DALY in India.³ Recent reports indicate that nearly 1 billion adults had hypertension in 2000, and will increase to 1.56 billion by 2025, mostly in developing nations. In six decades it increased from 2% to 25% among urbans and from 2% to 15% among the rurals in India.⁴ Various factors are increased life expectancy, urbanization, lifestyle changes, stress, increasing salt intake, awareness and detection and the overall epidemiologic transition. Early identification of at-risk persons using simple screening and appropriate lifestyle intervention would greatly help in preventing / postponing the onset of diabetes, Hypertension.

With these back grounds, a study was undertaken to find the prevalence, risk factors of these diseases, in rural population of District Ghaziabad, which was never done earlier.

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MATERIAL AND METHODS: This cross sectional study was carried out, in one of the rural health Centre of a medical college in district Ghaziabad. The health Centre caters to a population of about 60000, and is equipped with all equipments required for primary care in rural area. Before study, Institutional Ethical committee approval was taken. Posters were put up about the study, inviting all men for diagnosis and treatment of high blood pressure, obesity and Diabetes mellitus to the health Centre.

STUDY POPULATION: INCLUSION CRITERIA: All males in age group of 35- 50 yrs, who reported to the health Centre serially during its working hours were taken in the study. This age group was selected deliberately, because of being most vulnerable for life style diseases, and shouldering high responsibilities for their family's /communities/, place of employment and most productive, besides being main earning members in the family. They are mature, amenable for suggestions and not beyond redemption.

EXCLUSION CRITERIA: Those not willing to participate in the study.

BASELINE MEASUREMENTS: A predesigned and pretested proforma was administered to all participants reporting to health Centre. It included questions on medical history, socioeconomic factors, smoking habits, diet, family history of hypertension and diabetes, physical activity etc.

Thereafter, Height in Centimeters and weight in Kilograms rounded to nearest 100 grams was taken without shoes, and with light clothes and filled up in the questionnaire for the study. BMI was calculated as weight in Kilograms divided by square of the height in meters. BMI value of more than 25 was taken as abnormal. Blood pressure was measured after reassuring, twice from right arm after 5 minutes of sitting quietly, using a mercury sphygmomanometer. Mean of these 2 readings was recorded. A person was considered to have hypertension, if it was more than 140/ 90 mm of Hg, or if he reported having taken anti-hypertensive drugs during preceding 7 days.

Participant was told to come next morning for testing fasting blood sugar level. This was done with a glucometer, from left ring finger tip, under all aseptic precautions, in the Centre. However, it was observed that, most of men did not come back for PP sugar testing, being away on jobs, hence only fasting blood sugar was considered in this study.

Confirmed strict vegetarians who consume predominantly foods of plant origin, with milk and other dairy products were included in vegetarian group and those consuming foods of plant and animal origin were included in non-vegetarian group.⁵

Sedentariness was assessed by screen time (hours/day spent before the TV or computer) and (separately) sitting time (hours per day spent sitting for any purpose). Incidental exercise was measured by the frequency of housework or farming/job work, categorised as follows: ≤ 3 times/month; 1-2 times/week; 3-4 times/week; most days as given following. This weighting system is based on the recommendation of the International Physical Activity Questionnaire.⁶

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Category of physical activity	Categorical Score- three levels of physical activity are proposed
Mild	No. activity is reported OR Some activity is reported but not enough to meet Moderate and Sever
Moderate	Any one of the following 3 criteria a. 3 or more days of vigorous-intensity activity of at least 20 minutes per day. OR b. 5 or more days of moderate-intensity activity and/or walking of at least 30 minutes per day. OR c. 5 or more days of any combination of walking, moderate-intensity or vigorous.
Severe	Any one of the following 2 criteria Vigorous-intensity activity on at least 3 days OR 7 or more days of any combination of walking, moderate- or vigorous- intensity

*vigorous equivalent to fast Walking approximately 5000 steps per day.

STATISTICAL ANALYSES: Chi square test was applied on all the data by using EPI Info software.

OBSERVATIONS/RESULTS:

Sl. No.	Contents	Age group 35-40 yrs	Age group 41-45 yrs	Age group 46-50 yrs	Total	Chi square values	P values	Highly Significant/Not significant	df
1	Age wise distribution of Study group	853 (76.16%)	243 (21.70%)	24 (2.14%)	1120 (100%)	-	-		-
2	BMI more than 25	164 (19.20%)	92 (37.86%)	2 (8.33%)	258 (25.03%)	40.03	P<0.0001	HS	2
3	Blood Pressure above 140/90 mmHg	121 (14.18%)	61 (25.10%)	4 (16.66%)	186 (16.87%)	16.28	0.0003	HS	2
4	Positive Family History of Hypertension in total study group	15 (1.76%)	10 (4.16%)	3 (12.5%)	28 (2.5%)	8.07	0.0177	HS	2
5	Hypertensive (table 3) having family History of Hypertension	8 (6.6%)	5 (8.2%)	1 (25%)	14 (7.53%)	0.42	0.8106	NS	2
6	Total No. of participants with fasting Blood Sugar>126mg%	63 (7.38%)	24 (9.87%)	2 (8.33%)	89 (7.94%)	10.04	0.0066	HS	2
7	Positive Family History of Diabetes mellitus in total study group	15 (1.8%)	4 (1.6%)	1 (4.2%)	20 (1.8%)	0.02	0.9900	NS	2

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8	Diabetics (table 6) with Family History of Diabetes Mellitus	5 (7.9%)	2 (8.3%)	0 (0%)	7 (7.90%)	0.07 Fisher exact 2 tailed applied	0.9656	NS	2
9	History of Smoking/Tobacco addiction in total study group	151 (17.7%)	74 (30.45%)	12 (50%)	237 (21.16%)	30.66	P<0.0001	HS	2

Table 1: Prevalence of Hypertension, DM, & relevant family History-(Age Group wise) with P values

From table 1, serial 2, it is seen that abnormally higher BMI of more than 25, is maximum (37.86%) in age group 41-45 yrs. From serial 3, it is seen that Hypertension is also maximum (25.10%) in this age group. Interestingly, as per serial 6, this group is also found to have highest numbers (9.87 %) of subjects with high blood sugar levels. As per serial 4, it is seen that 28 subjects out of 1120, (2.5%) have positive family history of Hypertension, whereas, as per serial 5, total of 7.53% hypertensives had positive family history of Hypertension. As per serial 7, out of total subjects of 1120, 1.8% had family history of DM, whereas, as per serial 8, out of total diabetics (fasting blood sugar more 126mg %), 7.90% were found to have positive family history of DM. As per serial 9, maximum tobacco users were in age group of 46- 50 yrs, second to 41- 45 yrs. Tobacco use is seen to increase with age groups of subjects, from 17.7 % to 30.45 %, to 50 %, over all 21.1 %.

Sl. no. Contents	35-40 Years	41-45 Years	46-50 Years	Total	Chi square value	P value	df	Significance
10. Dietary Habits					11.04	0.00401	2	HS
A. Vegetarian	336 (39.39%)	81 (33.33%)	16 (66.67)	433 (38.66%)				
B. Non vegetarian	517 (60.61%)	162 (66.67%)	8 (33.33%)	687 (61.34%)				
Total of A+B	853 (100%)	243 (100%)	24 (100%)	1120 (100%)				
11. Physical activity					24.42	0.000005	4	HS
A. Mild	240 (28.14%)	104 (42.80%)	8 (33.33%)	352 (31.43%)				
B. Moderate	482 (56.51%)	97 (39.92%)	9 (37.5%)	588 (52.5%)				
C. Severe	131 (15.36%)	42 (17.28%)	7 (29.17%)	180 (16.07%)				
Total of A+B+C	853 (100%)	243 (100%)	24 (100%)	1120 (100%)				

Table 2: Dietary habits and Physical activity

DISCUSSION: From table1,serial no 1, it is seen that out of total 1120 participants, who responded & reported for checkup in this study,853 (76.16%) were from comparatively younger age group of 35-40 yrs, indicating increasing health consciousness in younger people.

As per table1, serial no 2, total 258 participants, i.e. 25.03% among study group had abnormally higher BMI.34.61% participants had normal BMI of below 25 in all age groups. In high

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BMI group, 41-45 yrs age sub group were maximum (37.86%) in obesity. This sub group had also maximum cases of hypertension (25.10%) & diabetes (9.87%), validating a well-known association.

As per table1, serial no 3, total 186 participants were found to be hypertensive out of 1120, giving prevalence rate of 16.87% among study group, which is approximately same as national level. In a study [2012] by M Gupta, P. Parashar, B. Nath, R. Bansal study this was found to be 18% in rural area of Meerut.⁽⁷⁾

First author	Year	Place	Age (Yrs)	Sample size	Prevalence %
Hazarika	2004	Assam	>30	3180	33.3
Thankappan	2006	Kerala	>30	2159	36
Krishnan A	2008	Haryana	15-64	2828	9.3
S.S. Todkar	2009	Maharashtra	≥ 20	1297	7.2
G. Vijay Kumar	2009	Kerala	≥ 18	1990	36.1
R. Bhardwaj	2010	Himachal	≥ 18	1092	35.9

Table 3: Studies (2004 – 2010) on prevalence of hypertension in rural Indian population

Our present study, with 16.87% prevalence is nearer to studies by A. Krishnan & S. Kinra above while other studies (As given above) have reported higher prevalence.

The prevalence of high normal blood pressure (also called pre hypertension in) has been found to be around 32% in a recent urban study from Central India. In studies from South India (Chennai) and from Delhi prevalence of high normal blood pressure has been even higher up to 36% and 44% respectively in these regions. The prevalence of hypertension increases with age in all populations. In a recent urban study it increased from 13.7% in the 3rd decade to 64% in the 6th decade.

Preventive measures are required so as to reduce obesity, increasing physical activity, decreasing the salt intake of the population and a concerted effort to promote awareness about hypertension and related risk behaviors. Two upcoming studies,

for identification of regional differences of CVD risk factors in India, are the India Heart Watch and PURE studies. PURE26 is a Prospective study localized to five urban and five rural locations while India Heart Watch 27 has centers all over the country. These Studies shall further highlight the prevalence and regional variations of hypertension as a CVD risk factor.

Table1, serial no 4, shows, out of total study group, 28 participants (2.5%) had positive family history of hypertension.

As per serial no 5, 14 participants, i.e. 7.53 % out of all hypertensive subgroup of 186 found in this study, had given positive family history of hypertension, which could not be compared / verified with other studies.

From serial no 6, it is seen that, 89 participants had fasting blood sugar more than 126 mg%, giving a prevalence rate of 7.94 % among study group. This is more or less comparable to diabetes prevalence of rural areas at national level. As per IDF diabetes atlas (2013) the prevalence of diabetes is 8.2% in S.E. Asia.¹

According to V. Mohan, S. Sandeep, R. Deepa, B. Shah & C. Varghese [2007] the prevalence of diabetes in those above 40 yr of age, was 5 per cent in urban and 2.8 percent in rural areas.² Gupta R from Jaipur, through three epidemiological studies carried out during 1994,⁸ 2001,⁹ and 2003.¹⁰

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demonstrated rising trend rates of diabetes 1%, 13%, and 18% respectively among males and 1%, 11% and 14% respectively among females. According to the study of Himanshu Madan et al at Sonipat prevalence of Diabetes Mellitus in Rural Population, 18.43% was found to be having diabetes.¹¹ C. Muninarayana, G. Balachandra in their 2010 surveys indicate that diabetes now affects a staggering 10-16% of urban population and 5-8% of rural population in India.¹²

The dramatic rise in the prevalence of type 2 diabetes and related disorders like obesity, hypertension and the metabolic syndrome could be related to the rapid changes in life style that has occurred during the last 50 yr. Although this “epidemiological transition”, which includes improved nutrition, better hygiene, control of many communicable diseases and improved access to quality healthcare have resulted in increased longevity, it has also led to the rapid rise of the new-age diseases like obesity, diabetes and heart disease. The intrusion of western culture into the lives of traditional indigenous communities, more use of machines, vehicles, money power, stress, has also had devastating results in terms of the rise in diabetes and related metabolic disorders.

As per serial no 7, from among total study group of 1120, 20 (1.8%) had family history of diabetes.

As per serial no 8, Out of these 89 participants found to have higher blood glucose levels, 7 (7.90%) had family history of diabetes. This finding could not be compared with other sources.

Serial no 9, shows, smoking history of study group, which reveals that total 237, (21.16%) participants, were smokers. Also, 50 % of total smokers in study group of age 46-50 years, were having second highest no. of diabetes and hypertension validating the well-known risk factor of smoking for these diseases.

As per Table no 2, out of total 853 participants in 35 – 40 yrs of age, 19.20%, were having BMI >25, 60.61% of participant were on non-vegetarian diet and 28.14 % were doing mild type of physical activity; while in 41-45 yrs of age group, 37.86%, were obese, out of which, 66.67% were non-vegetarian and 42.8 % having mild physical activity. Overall, 21.16% were smokers.

All participants detected with abnormal findings & habits, were given health education and appropriate advice. Healthy individuals were told to be on guard & do yearly check up with doctors in health Centre.

CONCLUSION: The study provides insight in important data on high burden of prevalence of Hypertension, Diabetes Mellitus, and the associated risk factors in a rural population in a health Centre. Life style modifications, such as more physical activity, lesser intake of non-vegetarian items which uses more oil/ ghee for cooking, & extra butter, salt in the diet, cessation of smoking will result in down ward risk & trend of these life style diseases. Simultaneously health education was imparted to total study group.

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AUTHORS:

1. Narendra Singh
2. A. K. Dixit

PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Community Medicine, Santosh Medical College, Ghaziabad.
2. Professor & HOD, Department of Community Medicine, Rama Medical College, Hapur.

NAME ADDRESS EMAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Narendra Singh,
Flat 1638, Brahmaputra Apartment,
Sector-29, Noida.
Email: narendra.singhv@gmail.com

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