

Role of Life Style Factors on Diabetic Profile of Young Adults (30-45years) In Rural Area of Chargawan Block of Gorakhpur

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Abstract:

Objectives: To study the association of life style factor type 2 Diabetes Mellitus in rural area among young adults (30-45 years age).

Study design: A cross-sectional study

Study Settings: Chargawan block in Gorakhpur District of Uttar Pradesh.

Study subject: People in the age group of 30 -45 years residing in rural areas of Chargawan block:

Study Period: 1st Aug 2021-31st July 2022

Study variable: Dietary habit, Smoking, Alcohol, Tobacco chewing, Physical activity.

Result: A cross sectional epidemiological study was carried out in rural area of Chargawan Block of Gorakhpur. The prevalence of DM II as screened out was 18.3%. The prevalence of Diabetes was found more in vegetarian (25.0%) than mixed diet (17.8%). Proportion of diabetic among smokers were (35.5 %) double than that of non smokers (16 %). Prevalence of Diabetes (31.2%) is more in the study subjects who is consuming alcohol than those who were non alcoholic (15.2%), the prevalence of Diabetes Mellitus (29.2%) is more than who do not consume tobacco products. Though in relation to dietary intake, alcohol consumption, smoking status and tobacco intake, association was found insignificant. Subjects with mild level of physical activity had greater prevalence of Diabetes (25.5 %) followed by the moderate level of physical activity (15.7%). Participants with vigorous activity were all non diabetic which shows the difference was significant.

Conclusion: Out of 30 diabetes mellitus, 09 were newly diagnosed on the basis of Diagnostic criteria of Diabetes recommended by WHO during this study. Role of physical activity in relation to DM II was very well understood, those participant who involved in vigorous physical activity were non diabetic. In relation to Dietary habit, Smoking, Alcohol and Tobacco chewing no significant association was found, might be due to lesser number of participant in each category.

Key words: life style pattern

Keywords: RDW –Recently delivered woman

Keywords: Homebase newborn care, Tetanus toxoid, Iron folic acid

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I. Introduction

Diabetes is a group of metabolic disorder characterised by elevated levels of blood glucose (or blood sugar), which leads over time to serious damage to the heart, blood vessels, eyes, kidneys and nerves [1]. Diabetes is a chronic disease that occurs either when the pancreas does not produce enough insulin or when the body cannot effectively use the insulin it produces. Insulin is a hormone that regulates blood glucose [2]. Hyperglycemia, also called raised blood glucose or raised blood sugar, is a common effect of uncontrolled diabetes and over time leads to serious damage to many of the body's systems, especially the nerves and blood vessels [3]. Type 2 diabetes accounting for majority of the cases, can lead to multiorgan complication, broadly

divided into microvascular and macrovascular complications. These complications are a significant cause for increased premature morbidity and mortality among individuals with diabetes, leading to reduced life expectancy and financial and other costs of diabetes leading to profound economic burden on the Indian health care system. Current global statistics shows that 463 million and 374 million individuals have diabetes and impaired glucose tolerance (IGT) respectively, a prediabetic condition[4]. These numbers are estimated to increase to 700 million people with diabetes and 548 million people with IGT by 2045, which represents a 51% increase compared to 2019 [5]. The disease, once considered as the problem among the rich, urban habitants, and old age, is now prevalent among all of socioeconomic group and in all ages. The burden of diabetes is high and increasing globally, and in developing countries like India, mainly fueled by the increasing prevalence of overweight, obesity and unhealthy lifestyles. The risk for diabetes is largely influenced by ethnicity, age, obesity, and physical inactivity, unbalanced diet, and behavioral habits in addition to genetics and family history. According to WHO, the prevalence of diabetes is growing most rapidly in low and middle income countries. The rapid socioeconomic change in conjunction with urbanization and industrialization are the major factors for the global increase in the diabetic epidemic. The majority of population reside in rural areas (70%) of which young population contribute 65%. This population going on adapting modern life style, which was not meet earlier among them. By this way, they are becoming more prone to increasing burden of diabetes and associated complications, the surplus of lack of knowledge regarding risk factors and preventive approach also play important role in multiplying cases of diabetes. Because of increasing incidence and prevalence with time, now India is deemed as the world's capital of Diabetes. The young Indian population, which constitutes 65% of the country, is fast adapting to a new lifestyle, which was not known earlier. They are at high risk of the increasing burden of diabetes and associated complications. The new evolving lifestyle is not only affecting people's health but also mounting the monetary burden on a developing country such as India. Complications related to diabetes are becoming a major cause of morbidity and mortality in the young population. Rapidly increasing burden of Diabetes in the young might render population to early predisposition to age related disorders which adversely affect the quality of life. Approximately 57% of these individuals remain undiagnosed. The main purpose for choosing this topic, type 2 Diabetes mellitus is that There is a long latent asymptomatic period, thereby when detected in its early asymptomatic phase can be managed, controlled and even possibly reversed, resulting into enhanced quality and longevity of life, and the prevention or delay of its long term complication, and to make awareness among young adults regarding modern life style particularly in relation to diabetes mellitus. The present study, therefore has been planned to find out the prevalence of type 2 DM and life style of studied population in the rural area of Chargawan block of Gorakhpur district to focus on life style modification in rightway.

II. Material & Methods

The present study was carried out in Chargawan block of Gorakhpur District. 164 participants of age 30-45 years were included. Among the study participants 80 were males (48.8%) & 84 were females (51.2%) participants. Charagawan Block in Gorakhpur district consist of 1 block PHC and 4 additional PHC's. Out of these 1 block PHC Chargawan & 1 APHC Maniram were selected randomly. One sub centre was selected from block PHC Chargawan (7 subcentre) & from APHC Maniram (6 subcentre) randomly, therefore, a total of 2 sub centre Maheshra (4 village) & Narayanpur (8 village) were selected. 2 villages from each sub centre, i.e. a total of four villages selected randomly. Four lists from 4 villages (1 from each village) of 30 to 45 years of age obtained by the help of village development officer of the gram panchayat. The list of study population (containing name of participants and village name) from four villages was compiled in a single list. The participants name was shorted alphabetically. A list of 175 participants as a sample population was prepared by simple random sampling (40 participants from village 1, Shekhpura, 50 participants from village 2, Moharipur, 44 participants from village 3 Mirzapur, 42 participants from village 4 Narayanpur). The selected participants were located with the help of health worker (ASHA & Aganwadi worker) and local people. Before collection of the data from the study subjects, written consent was taken in Hindi language after explaining the procedure and purpose of the study. Random blood sugar (RBS) was measured with digital glucometer, if RBS of study participants was raised (Blood glucose greater or equal to 200 mg/dl), it was further confirmed for diagnosis for type 2 DM by other test viz. fasting blood glucose on next day. Each participant of the sample population was directly interviewed with the help of a pre-designed, pretested questionnaire. Data obtained after the interviews of the participants were entered in to the Microsoft office excel sheet. Data was analyzed and appropriate statistical test was applied. All the necessary help, advice and counseling was given to the subjects who were found Diabetic.

Sample Size estimation is based on the National Family Health Survey (NFHS-5) [6], 2019-21 & recent studies where the prevalence of type 2 Diabetes Mellitus is around 10-14 per cent in age group of 30-45 years, therefore taking the prevalence of 12% and allowable error of 5%, sample size was calculated by using

Cochran formula. A sample size of 163 is obtained. Taking 5% of non responsive rate, a total of 175 samples was taken of which 11 were non respondent & final study participants was 164.

WHO diagnostic criteria of fasting plasma glucose

Result	Fasting Plasma Glucose (FPG)
Normal	less than 100 mg/dl
Pre diabetes	100 mg/dl to 125 mg/dl
Diabetes	126 mg/dl or higher

III. Result:

TABLE: 1
Distribution of Study subjects on the basis of their life style pattern

Characteristic		No.(N=164)	Percentage (%)
Dietary Habit	Mixed	152	92.6
	Vegetarian	12	7.4
Smoking	Yes	20	12.2
	No	144	87.8
Alcoholic	Yes	32	19.5
	No	132	80.5
Physical Activity	Mild	55	33.5
	Moderate	102	62.0
	Severe	7	4.2

Table 1 depicts the following picture: Majority i.e 92.6 percent of study participants consume mixed diet whereas only 7.4 percent were pure vegetarian. Among the study subjects ,20 per cent admitted for smoking while 32 per cent consume alcohol. One in three study participants were doing only mild physical activity, 62 percent moderate and only 4.2 study participants were doing vigorous physical activity.

TABLE: 2
Distribution of Study participants on the basis of their Diabetic Profile

	Frequency	Percent
Non Diabetic	87	53 %
Pre Diabetic	47	28.7 %
Diabetic	30	18.3 %
Total	164	100 %

Table 2 depicts the picture that among the study participants 30 subjects (18.3%) were found Diabetic, 28.7 % were Pre Diabetics. Out of 30 subjects who were Diabetics 21 subjects were already diagnosed and they were aware about their disease. 09 were newly diagnosed on the basis of Diagnostic criteria of Diabetes recommended by WHO in this study.

TABLE: 3
Association of Diabetes Mellitus with type of Diet

Type of Diet	Non Diabetic	Pre diabetic	Diabetic	Total
Mixed Diet	79 (52.0%)	46 (30.3%)	27 (17.8%)	152 (100%)
Vegetarian Diet	8 (66.5%)	1 (8.5%)	3 (25%)	12 (100%)
Total	88 (53.7%)	46 (28.0%)	30 (18.3%)	164 (100%)
Chi square(χ^2) test	$\chi^2= 5.049$		<i>p</i> - value=0.080	

Table 3 shows that majority of study subjects consume Mixed diet (veg. & non veg.) as compared to vegetarian. The prevalence was found more in vegetarian (25.0%) than mixed diet (17.8%) whereas association by cross tabulation was insignificant (p- value =0.080).

TABLE: 4
Association of Diabetes mellitus with smoking

Smoker	Non Diabetic	Pre Diabetic	Diabetic	Total
YES	10(50%)	3(15.0%)	7(35.0%)	20(100%)
NO	78(54.2%)	43(29%)	23(16.0%)	144 (100%)
Total	88(53.7%)	46(28.0%)	30(18.3%)	164 (100%)
<i>Chi square(χ^2) test</i>	$\chi^2= 4.915$ p- value=0.086			

Table 4 shows that proportion of diabetic among smokers were (35.5 %) were double than that of non smokers (16 %), however cross tabulation shows p value 0.086 which is not a significant value.

TABLE: 5
Association Diabetes Mellitus with alcohol consumption

Alcoholic	Non Diabetic	Pre Diabetic	Diabetic	Total
NO	73 (55.3%)	39 (29.5%)	20 (15.2%)	132 (100%)
YES	15 (46.9%)	7 (21.9%)	10 (31.2%)	32 (100%)
Total	88 (53.7%)	46 (28.0%)	30 (18.3%)	164 (100%)
<i>Chi square (χ^2) test</i>	$\chi^2=4.530$ p- value=0.104			

Table 5 Shows that Prevalence of Diabetes (31.2%) is more in the study subjects who is consuming alcohol than those who were non alcoholic. (15.2%).

TABLE: 6
Association of Diabetes Mellitus with tobacco consumption

Tobacco chewing	Non Diabetic	Pre Diabetic	Diabetic	Total
Yes	12 (50%)	5 (20.8%)	7 (29.2%)	140 (100%)
No	76 (54.3%)	41 (29.3%)	23 (16.4%)	24 (100%)
Total	88 (53.7%)	46(28%)	30 (18.4%)	164 (100%)
<i>Chi Square(χ^2) Test</i>	$\chi^2= 2.409$ p- value=0.300			

Table 6 Shows that among Study participants with a habit of tobacco chewing, the prevalence of Diabetes Mellitus (29.2%) is more than who do not consume tobacco products. On applying chi square test association was insignificant.

TABLE: 7
Association of Diabetes with level of physical activity

Life style	Non Diabetic	Pre Diabetic	Diabetic	Total
Mild	30 (54.5%)	11 (20%)	14 (25.5%)	55 (100%)
Moderate	51 (50%)	35 (34.3%)	16 (15.7%)	102 (100%)
Vigorous	7 (100%)	0	0	7 (100%)
Total	88 (53.7%)	46 (28.0%)	30 (18.3%)	164 (100%)
<i>Chi square (χ^2) test</i>	$\chi^2= 10.927$ p- value=0.027			

Table 7 depicts the picture that participants with mild level of physical activity have greater prevalence of Diabetes (25.5 %) followed by the moderate level of physical activity (15.7%). Participants with vigorous activity were all non diabetic. There was significant association present .

IV. Discussion

In present study association of type 2 Diabetes mellitus with Dietary habit, Smoking, Alcohol, Tobacco chewing and Physical activity was explored. This study revealed the prevalence of Diabetes mellitus is 18.3 % in study subjects (total 30 subjects out of 164 subjects), of which 21 were known diabetics, 09 were newly diagnosed during this study. A report made by Priyanka Rana singh et al through systemic review & meta analysis of 69 studies conducted from 1972-2017 reveals a prevalence of diabetes increased in rural India from 2.3 % to 15.0% in the year 2015-2017[7].

Modifiable risk factors are dependent to each other for example stressful condition increases the frequency of smoking which further disturbs the sleep pattern and eventually lead to decreased physical activity. Increase in calorie intake and inappropriate and unbalanced diet which has adverse effect on weight. In our study a significant association have been found between physical activity, and type 2 DM. A study carried out by Jagadeesha Aravinda for Risk factors in patients with type 2 diabetes in Bengaluru, among the patients who were diagnosed with T2DM, significantly higher proportion of patients followed a sedentary lifestyle compared to a strenuous one (74.89% vs 25.10%; $P < 0.0001$)[8]. In this study it was demonstrated that physical activity may contribute to 30-50% reduction in the development of Type2 DM.

In our study also the proportion of subjects who were doing mild physical activity have higher prevalence (25.5%, $p < 0.05$) as compared to moderate and severe physical activity.

A population based cross sectional studies carried out by Parul Puri et al on the "contribution of modifiable risk factors on the burden of diabetes among women of reproductive age group in India" had come to conclusion that decreased physical activity, increased BMI & Stress full condition are the major risk factors in developing the disease [9]. In relation to diet, Studies have shown that a low-fiber diet with a high glycemic index is positively associated with a higher risk of T2DM, and specific dietary fatty acids may affect insulin resistance and the risk of diabetes in varying degrees[10]. Total and saturated fat intake is associated with an increased risk of T2DM independently of BMI, but higher intake of linoleic acid has the opposite effect, especially among leaner and younger men. Diabetes prevention studies have demonstrated that diet composition is another important factor to prevent the development of T2DM. Epidemiological studies have suggested that the risk of diabetes can be increased or decreased owing to quantity and quality of dietary intake pattern. DM can be controlled through improvement in patient's dietary knowledge, attitudes, and practices. Although the prevalence of DM is high in our country, patients are still deficient in understanding the importance of diet in diabetes management. There is growing consensus that alcohol consumption is an influencing factor, the biological mechanism is uncertain, but there are several factors that may explain the relationship, including increases in insulin sensitivity after moderate alcohol consumption. In our study it was found that study participants who consume alcohol were all men, none of the women were found who consume alcohol, the question asked about only about alcohol intake and not on quantity, majority of the alcoholics consume it every day at evening after finishing their work. The study participants who belongs to lower class and work on daily wages considered alcohol as some kind of medicine which provide remedies against tiredness, act as anti allergic against dusty environment in which they work. They were unaware about the deleterious effect of alcohol. Our study shows prevalence of type 2 diabetes in alcoholic was 31.2% as compared to 15.2 % in non alcoholic. A systemic review and meta analysis on alcohol as a risk factor by Dolly O. Baliunas and Satya Mohapatra et al alcohol consumption is deleterious for type 2 diabetes mellitus in men and women[11]. Cigarette smoking is one of the most important modifiable risk factor for DM. Exposure to cigarette smoke is associated with vascular damage, endothelial dysfunction and activation of the blood-clotting cascade, so it is not at all surprising that the combined harmful effects of elevated blood glucose with cigarette smoking accelerates vascular damage in people with diabetes who smoke [12]. Quitting smoking substantially reduces risk aforesaid. Our study show that smokers have higher prevalence (35.0%) as compared to non smoker (16.0%). In 2015, a meta-analysis of 88 prospective cohort studies (almost 300,000 cases of new-onset T2DM), confirmed a significant association between smoking and T2DM risk, with a RR of 1.37 in smokers and 1.14 in former smokers compared to never smokers [13].

V. Conclusion And Recommendation

Overall prevalence of Diabetes Mellitus found to be 18.3%. Study participants who were alcoholic and smoker have higher prevalence of Diabetes Mellitus than who were non smoker and non alcoholic. Among the study participants who have only mild level of physical activity have higher prevalence (25.5%) of Diabetes.

This study recommends routine screening along with diagnostic test for type-2 diabetes mellitus for all adults aged 30 years & above, so as to detect the disease early and take appropriate measures timely. General awareness regarding the modifiable risk factors like high fat intake, habit of tobacco chewing, smoking, low physical activity must be establish with appropriate diet changes, increased physical activity like walking, jogging etc after a thorough consultation at a health facility.

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