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## RESEARCH ARTICLE

# ASSESSMENT OF SOCIAL AND LIFE STYLE FACTORS ASSOCIATED WITH THE RISK FOR TYPE 2 DIABETES MELLITUS IN JAMMU REGION OF J&K STATE, INDIA

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**ABSTRACT**

Type 2 diabetes mellitus is an extremely complex disease with a tremendous social and economical burden. This risk of this disease is further compounded by various environmental, biochemical as well as anthropometrical risk factors. The present study focused on the association of life style factors with the onset and progression of Type 2 diabetes mellitus. A total of 450 patients were enrolled under the present study. On the basis of the information recorded from T2DM patients, males were more affected (61.3%) as compared to females (38.6%). The disease was significantly higher (52.6%) in people between age group 46-65 yrs. The incidence of the disease was higher in the people of urban areas (65.7%). 55.5% were no smoker/ non alcoholic category which included both male and females. Mixed percent frequency was observed in case of eating habits, addiction and employment status. The consumption of Mustard oil was a common practice and was used by majority of the patients. The present study is an addition to the existing literature regarding the association of the risk factors responsible for T2DM. This research work is an attempt to make the general public about this association so that the incidence of the disease can be checked out.



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## INTRODUCTION

Diabetes, literally a 'sweet' disease, is slowly but surely spreading around the world, and India today is home to one of the world's fastest-growing diabetic population. The fundamentals of diabetes control largely depend upon drug therapy and lifestyle measures (increased physical activity and restriction of energy intake/diabetic diet). The quality and quantity of the diet intake is often ignored by the people which actually becomes a triggering factor for diabetes. Compared to Type 1 Diabetes, T2DM is most common form of diabetes; it accounts for over 90% of all diabetic cases worldwide (Gonzalez *et al*. 2009). The disease usually occurs after the age of 35-40 years but may be diagnosed earlier, especially in the populations with high prevalence of the disease. T2DM can remain undetected (asymptomatic), for several years and the diagnosis is often made from the associated complications or incidentally through an abnormal blood or urine glucose test.
Type 2 diabetes mellitus is an extremely complex disease with a tremendous social and economical burden. Patients that suffer from T2DM have a reduced quality of life and decreased life expectancy. According to the World Health Organization, Southeast Asia and the Western Pacific region are at the forefront of the current diabetes epidemic with India and China facing the greatest challenges. India has the highest number of diabetic patients in the world (50.8 million) and this is projected to increase to 87 million by the year 2030 (Mohan *et al.* 2010). The etiology of T2DM is not fully understood, but presumably, T2DM develops when a diabetogenic lifestyle (i.e. excessive caloric intake, inadequate caloric expenditure, obesity etc.) acts in conjugation with a susceptible genotype. Diet and nutritional intake are modifiable risk factors in the development of diabetes. Generally, studies show that dietary patterns characterized by a high consumption of vegetables, fruits, fish, poultry, and whole grains are inversely associated with diabetes risk, whereas dietary patterns characterized by a high intake of red or processed meats, refined grains, fried foods, and sweets demonstrate a positive association with diabetes. Obesity is often considered as a major risk factor for

### Type 2 diabetes

A variety of environmental factors have been implicated in the clinical expression of T2DM. Some of these factors are the degree and type of obesity, sedentarity, malnutrition in fetal and perinatal periods, lifestyle, and different kinds of drugs (e.g, steroids, diuretics, anti-hypertensive agents). T2DM involves a complex interaction between genetics and the environment, and there are proximal factors (family and

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friends) and distal factors (society and norms) that can influence health behaviours (Froguel & Velho, 1999). The main factors associated with the development of T2DM are genetic predisposition, increasing age, increasing body fat and environmental factors, such as urbanization and industrialization (Bopape, 2000; Cook, 2007). Increased longevity and changes in lifestyle from a traditional healthy and active life to a modern, sedentary, stressful life coupled with the overconsumption of energy-dense food (Evenson *et al*. 2002; Lambert & Kolbe-Alexandra, 2006) is also part of the etiology. In India, as in other parts of Asia, the economy has been rapidly expanding during the last decade, leading to profound changes in society. As a result, there is a polarization in disease patterns with under-nutrition and its related diseases coexisting with chronic diseases such as diabetes and obesity that are typically associated with industrialized population. In order to know the prevalence of the disease T2DM and to work out the association of genetic and non- genetic risk factors responsible for the disease, the present study was carried out.

## MATERIALS AND METHODS

The study population comprised 450 diabetic subjects. After recruitment of the subjects based on selection criteria and obtaining informed consent, the details of the study methodology were explained to them; a detailed history, including data on age, sex, education, occupation, smoking status, alcohol consumption, diabetic diet, method of cooking etc.

All anthropometric measurements like height, BMI, Waist hip ratio, age, onset of T2DM and duration of T2DM were recorded using standardized procedures. Under the present research study, factors like economic status, education and occupation, area distribution, age, gender etc. were studied. The Life style factors included alcohol or smoke addiction, cooking media, eating habits, physical activity were also studied to understand the association of factors with the origin and progression of the disease T2DM in the selected population groups

## RESULTS AND DISCUSSION

The results of present study concluded in Table 1 showing that males were more affected (61.3%) as compared to females (38.6%). The disease was significantly higher (52.6%) in people between age group 46-65 yrs. The incidence of the disease was higher in the people of urban areas (65.7%). The people having sedentary mode of life showed higher risk for type 2 diabetes. Mixed percent frequency was observed in case of eating habits, addiction and employment status. Among the non genetic risk factors which are believed to be associated with the disease T2DM, age is one of the important parameter that is considered to have association with the onset of the disease T2DM.

Studies on the association of age with the disease T2DM had been carried out by various workers [Ramachandran *et al*. (2008); Qiao *et al*. (2003); Rahim *et al*. (2007); Deo *et al*. (2006); Kumar *et al*. (2008); Shera *et al*. (2010); Katikireddi *et al*. (2011), Patel *et al*. (2012). During the present study on both the rural and urban population groups the prevalence of the disease T2DM was found to be higher in urban population. The information on the lifestyle and eating habits of the patients and healthy individuals was also recorded. To understand the association of the eating habits (i.e., either vegetarian or nonvegetarian) with the development of the disease T2DM, the diet pattern of all the 250 patients was recorded.

**Table 1. Summary of the various life style and social factors associated with the Type2 Diabetes**

| Demographic features analyzed | | Total no. of patients (n=450) | Frequency (%) |
|---|---|---|---|
| Gender | Male | 276 | 61.3 |
| | Female | 174 | 38.6 |
| Age | 26-45 yrs | 108 | 24 |
| | 46-65 yrs | 237 | 52.6 |
| | 65 and above | 105 | 23.3 |
| Socio economic status | High economic class | 162 | 36 |
| | Middle class | 231 | 51.3 |
| | Lower class | 57 | 12.6 |
| Occupation/ Employment | Business class | 102 | 22.6 |
| | Housewives | 132 | 29.3 |
| | Service holders | 125 | 27.7 |
| | Retired individuals | 30 | 6.6 |
| | Farmers and day labourers | 61 | 13.5 |
| Area distribution | Rural | 154 | 34.2 |
| | Urban | 296 | 65.7 |
| Eating habits | Vegetarian | 292 | 64.8 |
| | Non-vegetarian | 158 | 35.1 |
| Addiction | Smoking | 30 | 6.6 |
| | Alcohol | 170 | 37.7 |
| | None | 250 | 55.5 |
| | Desi Ghee | 106 | 23.5 |
| Cooking Media | Mustard oil | 174 | 38.6 |
| | Refined oil | 81 | 18 |
| | Dalda | 89 | 19.7 |
| Physical activity | Sedentary | 225 | 50 |
| | Moderate | 138 | 30.6 |
| | Heavy | 87 | 19.3 |

In general, four different types of cooking media i.e., Desi ghee, Mustard oil, Refined oil and Dalda have been commonly used by the population groups living in the region selected for the present study. Among these, mustard oil was used by 38.6% patients and refined oil by 18% patients use, however, 11.3% used mixed cooking media. Very low frequency of the patients was found who use dalda as cooking media. Physical activity has been shown to be inversely related to obesity and fat distribution, particularly visceral obesity (Steinberger & Daniels, 2003; Chaput *et al*. 2011).

Moderate physical activity has been shown to be associated with significant benefits in cardiovascular risk reduction, improvement in glycaemic control and prevention of diabetes (Mayer *et al*. 2001; Tall, 2002). In the present study it was found that 50% patients were leading sedentary life style. 30.6% patients were leading active life but they were performing little exercise as well as less physical work, however, only 19.3% patients had been regularly going in for walk and performed physical exercise regularly (Musaiger et la. 2002). Physical activity plays an important role in the prevention of T2DM as people who are physically less active have been reported to be more susceptible to the T2DM because this category generally leads to sedentary life style (Ramachandran *et al*. 2006). These workers have recorded considerable influence of sedentary life style with the disease. Therefore, from the present study and the existing literature it is evident that prevention, origin and progression of the metabolic disorders especially the disease T2DM, physical activity i.e., active life style in any form is an important component of the human life.

To study the association of smoking with the T2DM patients, 450 patients were categorized as i.e., Smokers and Non-Smokers. It was found that out of the 450 patients, 55.5% were no smoker/ non alcoholic category which included both male and females. Sairenchi *et al*. (2004), Radzeviciene & Ostrauskas, (2006), Hur *et al*. (2007), Ekpenyong *et al*. (2012) in their separate studies reported that smoking to be an independent and modifiable risk factor, as the early smoking cessation could decrease the risk for developing T2DM. Present study is in support of the workers who found an association of BMI and WHR with the disease T2DM. Both sexes had increased BMI and WHR and were suffering from the disease T2DM. These patients were in the age group of 45-55 years and were with urban background suggesting thereby that urbanization has strong influence on the disease as also pointed by workers like Hussain *et al*. (2005); Rahman *et al*. (2007); Ramachandran *et al*. (2008); Oktavianthi *et al*. (2012). Thus the present study is addition to the existing data on the association of BMI and WHR with T2DM

**Conclusion**

The present study is an effort to generate a database of frequency distribution to understand the correlation between various non genetic risk factors and T2DM. Jammu region is one of the regions where most of the people are not aware of the contribution of the above mentioned factors in the progression of the disease. So this is an attempt to make the general public about this association so that the incidence of the disease can be checked out.

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