

GLUCOSE INTOLERANCE IN RELATION TO SOCIOECONOMIC STATUS AND GENDER IN POPULATION OF SRINAGAR CITY

Javid Ahmad¹, Sheikh Shoib², Mohammad Ashraf³, Muneer Ahmad Masoodi⁴,
Rafiq Ahmad⁵, Rauf-ur Rashid⁶, Ashfaq Ahmad⁷, Haamid Bashir⁸

ABSTRACT

Objective: To assess the pattern of type -2 diabetes in different socioeconomic groups in the urban and peri-urban areas of Srinagar city.

Methodology: A detailed questionnaire on the Socioeconomic and Clinical background of the 1040 subjects was collected. After an overnight for blood fasting blood samples were drawn for determination of plasma glucose. Diagnosis of diabetes was based on the American Diabetes Association (ADA 2004).

Results: The overall Prevalence of the diabetes in the study population was 6.05% which included 4.03% of known diabetic and 2.02% undiagnosed subjects. There was significant difference between the prevalence of type 2 diabetes in men and women (3.6%vs 8.3% respectively, $P=0.0013$). Subjects belonging to higher socioeconomic status had greater prevalence of diabetes compared to lower 17.4% vs 3.2% ($P<0.001$)[middle class (class II & Class III) versus lower class(Class IV)respectively].

Conclusion: Socioeconomic factors influence the occurrence of diabetes in this study population, with prevalence being more come in the middle Class.

Key Words: Glucose intolerance, Srinagar, Socioeconomic status, Urban.

This article may be cited as: Ahmad J, Shoib S, Ashraf M, Masoodi MA, Ahmad R, Rashid R, et al. Glucose Intolerance in Relation to Socioeconomic status and gender in population of Srinagar City. J Postgrad Med Inst 2012; 26(4): 352-5.

^{1,5}Department of Social and Preventive Medicine, Sher-i-Kashmir Insitute of Medical Sciences, Medical College, Srinagar - India

²Department of Psychiatry, Govt. Medical College Srinagar Srinagar and Associated Hospital, Srinagar - India

³Department of Pediatrics, Sher-i-Kashmir Insitute of Medical Sciences, Medical College & Hospital, Srinagar - India

⁴Department of community Medicine, Govt. Medical College, Srinagar - India

^{6,7}Department of community Medicine, Sher-i-Kashmir Insitute of Medical Sciences, Soura - India

⁸Department of Biochemistry, University of Kashmir - India

Address for Correspondence:

Dr. Sheikh Shoib

Department of Psychiatry,
Govt Medical College, Srinagar-190010 - India
E-mail: sheikhshoib22@yahoo.com

Date Received: November 14, 2011

Date Revised: January 29, 2011

Date Accepted: June 11, 2012

INTRODUCTION

Diabetes represents a major public health burden, both locally and globally¹. From 1985 to 2000, the number of people living with diabetes globally rose from 30 million to 171 million¹. An estimated 285 million people corresponding 6-8% adult population will live with diabetes in 2010. The number is expected to increases to 438 million by 2030. With an estimated 50.8 million people living with diabetes, India has the world's largest population followed by china with 43.2 million². The recent increase of diabetes in India and projections for the future constitute a major public health problem. High socioeconomic status groups in the India unsurprisingly have higher prevalence of diabetes³.

Chronic diseases such as diabetes are causing substantial economic and life losses in low and middle income countries⁴. Sedentary life style of urban and peri-urban people, less exercise, results in double burden of high calories intake and causes serious complications like obesity, diabetes etc^{5,6}. Previous study from Kashmir valley has documented a high prevalence of diagnosed (1.89%) and undiagnosed (4.25%) Diabetes Mellitus and impaired glucose tolerance (8.09%) in Kashmiri adults aged 40 years or more⁷.

In view of above we have attempted to know pattern of glucose intolerance in different socioeconomic groups in Srinagar city, in the hope of stimulating more in-depth research.

METHODOLOGY

This cross sectional study was undertaken in the field practice area of Government Medical College, Srinagar, Kashmir comprising of 124 villages (urban and peri-urban areas). The study population included subjects in the age group 20 years and above irrespective of gender (excluding pregnant females). A multistage sampling procedure was adopted for the survey. A list of villages was framed and randomization was done in such a manner as to include 10% villages. Ten percent of all the households in the selected villages were visited. From the selected households the prevalence of Diabetes (known and unknown) and its associated risk factors was estimated.

The selected households were visited and interacting with the head of household, the purpose of visit was explained to him. He was requested to motivate the other members of the house who constitute the study subjects (all males and non-pregnant females 20 years and above) to participate in the study. A pretested questionnaire that explored demographic details, past history, presence of disease and age at diagnosis, family history of diabetes, dietary history, drug history, obstetric history (females), history of any other disease. Additional questions to the key informant of each house hold to assess the socioeconomic status of the households. Anthropometric measurements and blood pressure of each participant was recorded. Subsequently subjects were invited to the health centre in the morning after an overnight fast of at least 8 hours to screen for undiagnosed Diabetes. Blood samples were drawn for the determination of plasma glucose. In the case of fasting plasma glucose (FPG) \geq 126mg/dl a second determination was performed one week later. In addition, subjects with previous history or who were taking oral hypoglycaemic agents or insulin were considered to have DM. Subjects with known diabetes were not tested for FPG. Patients with diabetes were undergone through GTT (Glucose tolerance test) by standard procedure.

Body mass index was calculated using the formula weight (Kg)/height (m²). Waist and hip were measured using standard techniques and the mean of two measurements was taken for calculating the waist-hip ratio (WHR). Blood pressure was recorded in the sitting position in the right arm to the nearest 2mm Hg with a mercury sphygmomanometer. Two readings were taken 5 minutes apart and the mean of the two was taken as the blood pressure.

Diabetes was diagnosed based on drug treatment for diabetes (insulin or oral hypoglycaemic agents) and/or criteria laid by the ADA in 2004 i.e. fasting plasma glucose (FPG) 126 mg/dl or 2 hr. post-glucose value 200 mg/dl. Impaired glucose tolerance (IGT) was diagnosed if FPG was <126 mg/dl and 2 hr.post- glucose value (140 mg/dl and <200 mg/dl⁸.

Family history of diabetes was considered as positive if either or both the parents had diabetes. Physical activity level was graded as light, moderate and heavy based on a physical activity questionnaire, which included job-related and leisure time activities and specific questions on exercise. The monthly income of the family was recorded which the combined income of the husband and wife was taken as a single unit from all sources.

Socioeconomic status of each house holder was assessed, based on modified Kuppaswamy's socioeconomic status scale, which includes education, occupation of head of family and family income per month[INR]⁹.

The statistical analysis of the data was performed by using statistical package SPSS version 10.0 (statistical package for social; sciences version 10.0) Chicago, U.S.A for windows.

RESULTS

The overall prevalence of type 2 diabetes was 6.05%, among the 63 diabetes, 42 (4.03%of the population) were already known diabetes, the rest 21 (2.02%of the population) were newly detected by the survey (Table 1). The crude prevalence type 2 among men was (3.6%) and among women 8.3% (Table 2). The Socioeconomic status of families in the study was predominantly

Table 1: Distribution of Cases (n=1040)

Study	No.	Percentage
Known Diabetes	42	4.03
New Cases	21	2.01
Total	63	6.05

Table 2: Prevalence of Diabetes Mellitus with respect to Gender

Sex	No. of subjects (%)	Diabetics (%)
Male	500 (48.07)	18 (3.6)
Female	540 (51.92)	45 (8.3)
Total	1040	63

$\chi^2 = 10.22$, D.F =1; P=0.0013 (S)

Table 3: Socio-Economic Status with respect to Diabetics Mellitus

Social Class	Total No. of Cases	Diabetics (%)
I	-	-
II	254 (24.42)	31 (12.2)
III	380 (36.53)	20 (5.2)
IV	366 (35.19)	12 (3.2)
V	40 (3.84)	—
Total	1040	63

$\chi^2=21.35$, D.F=2; P=0.000 (S)

middle class. The Prevalence of diabetes was significant indifferent socioeconomic classes with frequency more among middle class (including upper and lower middle) as compared to lower class (Table 3).

DISCUSSION

The outcome of our study supports socioeconomic link of type 2 diabetes. The study clearly demonstrates that with the increase in socioeconomic status, there is a marked increase in the prevalence of diabetes. There is evidence from studies in developing countries that an increase in socioeconomic level is a risk factor for Diabetes and other disorders^{10,11}.

This is in marked contrast to the situation in most developed countries where individuals belonging to high SES have lower prevalence of these disorders^{12,13}.

This may be because in developing countries the epidemics of these diseases is still on rise and an increase in affluence leads to over nutrition, caloric excess, decreased physical activity and increased body weight, all of which contribute to a marked increase in the prevalence of these diseases. In contrast, changes in life style consequent to better education and health awareness have led to increased physical activity and decreased calorie and fat consumption which are probably responsible for lower prevalence rates

of the metabolic syndrome among affluent class in the Western world¹⁴.

In addition in developing countries the adaptation that occurs as the result of a faster transition in socioeconomic status could be one of the reasons for the high prevalence of various components of metabolic syndrome among the more affluent people. Results of the National Diabetes prevention control co-operative Group study in China have revealed an increased prevalence of Diabetes with economic development and changes from a traditional to modern life style¹¹ similar results have been reported from Bangladesh¹⁰ and Malaysia¹⁴.

CONCLUSION

Our findings indicate that current pattern of type 2 diabetes in Kashmir may be typically what many developing country populations are going through in their experience.

REFERENCES

1. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. *Diabetes Care* 2004;27:1047-53.
2. International Diabetic Federation. Diabetes data: IDF diabetes atlas 4th edition [Online]. 2009 [cited on 2010 Jan 18]. Available from URL: <http://www.idf.org/media/press-materials/>

diabetes-data

3. Ramachandran A, Snehalatha C, Vijay V, King H. Impact of poverty on the prevalence of diabetes and its complications in urban southern India. *Diabet Med* 2002;19:130-5.
4. Abegunde DO, Mathers CD, AdamT, Ortegon M, Strong K. The burden and cost of chronic disease in low income and middle income countries. *Lancet* 2007;370:1929-38.
5. Griffiths PL, Bentley ME. The nutrition transition is underway in India. *J Nutr* 2001;131:2692-700.
6. Ramachandran A, May S, Yamuna A, Murugesan N, Snehalatha C. High prevalence of diabetes and cardiovascular risk factors associated with urbanisation in India. *Diabetes Care* 2008;31:893-8.
7. Zargar AH, Khan AK, Masoodi SR, Laway BA, Wani AI, Bashir MI, et al. Prevalence of type 2 diabetes mellitus and impaired glucose tolerance in the Kashmir valley of the Indian subcontinent. *Diab Res ClinPract* 2000;47:135-46.
8. American Diabetes Association. Diagnosis and classification of diabetes mellitus. *Diabetes Care* 2004;27:5-10.
9. Kumar N, Shekhar S, Kumar P, Kundu AS. Kuppuswamy's socio-economic status scale-updating for 2007. *Indian J Paediatr* 2007;74:1131-2.
10. abu Sayeed M, Ali L, Hussain MZ, Rumi MA, Banu A, Azad Khan AK. Effect of socioeconomic risk factors on the different in prevalence of diabetes between rural and urban population in Bangladesh. *Diabetes Care*1997;20:551-5.
11. Pan XR, Yang WY, Li GW, Liu J. Prevalence of diabetes and its risk factors in china 1994. *Diabetes Care* 1997;20:1664-9.
12. Diez-Roux AV, Northridge ME, Morabia A, Bassett MT, Shea S. Prevalence and social correlates of cardiovascular disease risk factors in Harlem. *Am J Public Health* 1999;39:302-7.
13. Hazuda HP, Haffner SM, Stern MP, Eifler CW. Effect of acculturation and socioeconomic status on obesity and diabetes in Mexican. *Am J Epidemiol* 1988;128:1289-301.
14. Ali O, Tan TT, Sakinah O, Khalid BA, Wu LL, Ng ML. Prevalence of NIDDM and impaired glucose tolerance in aborigines and Malays in Malaysia and their relationship to socio demographic, health and nutritional factors. *Diabetes Care*1993;16:68-75.

CONTRIBUTORS

JA & SS conceived the idea planned the study and wrote the manuscript. MA, MAM, RA, RR, AA & HB did the data collection and analyzed the study. All the authors contributed significantly to the research that resulted in the submitted manuscript.