



CODEN (USA): IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.556778>Available online at: <http://www.iajps.com>

Research Article

**ASSOCIATION OF TYPE 2 DIABETES MELLITUS WITH  
SMOKING AT TERTIARY CARE HOSPITAL****Dr. Hamid Nawaz Ali Memon\*<sup>1</sup>, Dr. Zeeshan Ali <sup>2</sup>, Dr. Muhammed Khalid Shaikh<sup>3</sup>  
Dr. Mashal Dad<sup>3</sup>, Dr. Sumera Bukhari <sup>4</sup> and Dr. Zulfiqar Ali Qutrio Baloch <sup>5</sup>**<sup>1</sup>General Practitioner Zulekha Hospital, Dubai United Arab Emirates<sup>2</sup>Jinnah Postgraduate Medical Center Karachi<sup>3</sup>Department of Medicine, Liaquat University of Medical and Health Sciences (LUMHS)<sup>4</sup>St. Francis Medical Center, Trenton, New Jersey<sup>5</sup>Brandon Regional Hospital, Brandon, Florida, U.S.A**Abstract:****OBJECTIVE:** To determine the association of type 2 diabetes mellitus with smoking at tertiary care hospital.**PATIENTS AND METHODS:** This comparative cross sectional study of six months was conducted at tertiary care hospital at Hyderabad. The inclusion criteria of the study were fifty smokers of  $\geq 35$  years of age and either gender had history of smoking  $\geq 5$  years while fifty non cross sectional of same age group were also recruited as control group. The history was taken regarding the age for stating of cigarette smoking, number of cigarettes smoked per day, current smoking or ex-smoker and total duration of smoking. In known type 2 diabetic patients detailed history was taken regarding age at the time of diagnosis, medications used and whether the disease was controlled or not. Blood glucose was done in the pathology laboratory or by glucometer and other routine investigations were also carried out if required.**RESULTS:** During six months study total one hundred individuals (fifty smokers and fifty non smokers) were evaluated for diabetes mellitus. The mean age  $\pm$ SD for whole smoker and non smokers was  $50.98 \pm 7.86$  and  $48.84 \pm 8.63$  with male gender predominance. In smoker group the diabetes was detected in 34 (68%) patients while in non smokers the diabetes was identified in 12 (24%) individuals. The association is directly proportional to number of cigarette smoke and duration of smoking.**CONCLUSION:** The smoking is an independent risk factor for type 2 DM and observed in both the genders. The longer the duration of smoking, the more chances of developing type 2 diabetes mellitus.**KEYWORDS:** Smoking, Type 2 diabetes mellitus, Diabetes mellitus**Corresponding Author:****Dr. Hamid Nawaz Ali Memon,**

General Practitioner,

Zulekha Hospital,

Dubai United Arab Emirates.

Email: [zulfiqar229@hotmail.com](mailto:zulfiqar229@hotmail.com),

QR code



Please cite this article in press as Hamid Nawaz Ali Memon et al, Association of Type 2 Diabetes Mellitus with Smoking at Tertiary Care Hospital , Indo Am. J. P. Sci, 2017; 4(03).

**INTRODUCTION:**

Diabetes mellitus is a syndrome characterized by chronic hyperglycemia due to relative insulin deficiency, resistance or both. [1] It is a major health problem and is emerging as a pandemic. It is divided into type 1 and type 2 DM according to insulin secretion and resistance to insulin. [2,3] Recently cigarette smoking has been documented as an independent risk factor for type 2 DM. [4] Our study is based on this hypothesis, as smoking is the major risk factor for mortality and morbidity in developed countries.[5] In the USA it is estimated that more than 400,000 deaths result annually as a consequence of smoking. [6] Smoking is a major health problem in Pakistan responsible for heart and lung disease and major cause of mortality. [7] Current smoking leads to restricted daily life activities, bed ridden and disabilities due to chronic abuse and more institution and work absenteeism than non smokers.[8] Many of the deleterious health effects of active smoking have been associated with passive smoking.[9] In diabetic individuals, smoking increases the risk for both macro- and micro vascular disorders. Former literature raised the possibility that cigarette smoking is the risk factor for type 2 diabetes mellitus.[10] The reported relative risk for development of diabetes mellitus in smokers have 20-25 cigarettes per day ranged from 1.5 to 3.5 as compared to nonsmokers.[11] The risk directly proportional to increases in pack year history and number of cigarettes smoked per day. [12] Thus, this study was conducted to observe the association of type 2 diabetes mellitus with smoking at tertiary care hospital.

**PATIENTS AND METHODS:**

This comparative cross sectional study of six months was conducted at tertiary care hospital at Hyderabad. The inclusion criteria of the study were fifty smokers of  $\geq 35$  years of age and either gender had history of

smoking  $\geq 5$  years while fifty non cross sectional of same age group were also recruited as control group. The informed consent was taken from every individual to participate in the study while the detail clinical history, examination and relevant investigations were advised. The exclusion criteria of the study were the patients with type I diabetes, secondary diabetes, on drugs that impairs blood glucose level like corticosteroids, thyroid hormones, nicotinic acid, ciclosporin and thiazide diuretic, the pregnant ladies and gestational diabetes. The history was taken regarding the age for stating of cigarette smoking, number of cigarettes smoked per day, current smoking or ex-smoker and total duration of smoking. In known type 2 diabetic patients detailed history was taken regarding age at the time of diagnosis, medications used and whether the disease was controlled or not. The subjects who were not known diabetic, blood glucose measured and diagnose diabetes mellitus according to WHO criteria and in this manner all the subjects were divided into two groups i.e. diabetics and non-diabetics and the association of DM was found regarding the status and severity of smoking. Blood glucose was done in the pathology laboratory or by glucometer and other routine investigations were also carried out if required. The data was saved on pre-designed proforma and analyzed in SPSS 16. The frequency and percentage was calculated and the mean  $\pm$ SD was computed for numerical variables.

**RESULTS:**

During six months study total one hundred individuals (fifty smokers and fifty non smokers) were evaluated for diabetes mellitus. The mean age  $\pm$ SD for whole smoker and non smokers was  $50.98 \pm 7.86$  and  $48.84 \pm 8.63$  with male gender predominance. The results of the study are presented in Table 01.

**TABLE 01: THE AGE DISTRIBUTION OF SMOKER AND NON SMOKER POPULATION**

AGE (years)	SMOKERS	NON-SMOKER	TOTAL
35-39	10	15	25
40-49	15	10	25
50-59	10	20	30
60+	15	05	20
Total	50	50	100

**TABLE 02: THE GENDER DISTRIBUTION OF SMOKERS IN RELATION TO DIABETES MELLITUS**

GENDER	DIABETES MELLITUS		
	Yes	No	Total
Male	23	12	35
	67.6%	75.0%	70.0%
Female	11	4	15
	32.4%	25.0%	30.0%
Total	34	16	50
	100.0%	100.0%	100.0%

**TABLE 03: THE GENDER DISTRIBUTION OF NON SMOKERS IN RELATION TO DIABETES MELLITUS**

GENDER	DIABETES MELLITUS		
	Yes	No	Total
Male	8	27	35
	66.7%	71.1%	70.0%
Female	4	11	15
	33.3%	28.9%	30.0%
Total	12	38	50
	100.0%	100.0%	100.0%

TABLE 4: THE SMOKING HABITS IN SMOKER POPULATION

NUMBER OF CIGARETTES SMOKED/DAY	TOTAL SMOKERS	DIABETES MELLITUS
≤10	22	12
>10	28	22
<hr/>		
DURATION OF SMOKING (Years)	TOTAL	DIABETES MELLITUS
5-10	15	10
11-19	30	17
20+	05	07
<hr/>		
SMOKING STATUS	TOTAL	DIABETES MELLITUS
Current	37	29
Past	13	05

**DISCUSSION:**

The study proved the hypothesis that smoking is a risk factor for type 2 DM and the later is more common in smokers as compared to nonsmokers. The limitations of the study are that it was performed on different patients suffering from some disease and it

actually did not show the incidence of smoking and type 2 diabetes mellitus in the general population. It depends a lot on history and many patients mainly females may not give proper history especially of their smoking habits. Several studies have been done to find association of smoking in the etiology of type

2 DM. [3-6] A study conducted in Japan, [16] men who smoked >20 cigarettes per day observed to be diabetic as compared to nonsmokers and the findings are consistent with the present study. The observation also previously reported by several studies [17, 18] and shown that type 2 diabetes mellitus was more common in smokers as compared to nonsmokers and directly proportional to the number of cigarettes smoked per day. A study conducted formerly contains 21,068 male healthy individuals and had history of cigarette smoking since >10 years, on follow up 770 new cases of type 2 diabetes mellitus were detected with dose dependent cigarette smoking.[19] In present study the male population was predominant, the observation also reported by former study, while the duration and number of cigarette smoking also consistent with the former literature. Another study recruited 114,247 female smokers free from diabetes and follow up for 12 years and 2333 subjects were found to be diabetic. [20]

In present study the diabetes was found to be more prevalent in current smokers as compared to Ex-smokers, the findings are consistent with the study by Shimokata H et al and Wannamethee SG, et al [21, 22] A greater public awareness is required for the hazards of smoking and people should be educated regarding benefits of quitting smoking. Media advertisement of tobacco products should be banned and not encouraged. Smoking at public places should be prohibited and banned. In the last every effort should be made to stop people smoking for the best future of their family and country.

### CONCLUSION:

The smoking is an independent risk factor for type 2 DM and observed in both the genders. The longer the duration of smoking, the more chances of developing type 2 diabetes mellitus. Persons who smoke cigarettes for more than 20 years, increase number of cigarettes, or current smokers are at risk to develop type 2 diabetes mellitus.

### REFERENCES:

- 1.Chang SAH. Smoking and Type 2 Diabetes Mellitus. *Diabetes Metab J.* 2012 Dec; 36(6): 399–403.
- 2.Eliasson B. Cigarette smoking and diabetes. *Prog Cardiovasc Dis.* 2003 Mar-Apr;45(5):405-13.
- 3.Will JC, Galuska DA, Ford ES, Mokdad A, Calle EE. Cigarette smoking and diabetes mellitus: evidence of a positive association from a large prospective cohort study. *Int J Epidemiol.* 2001 Jun;30(3):540-6.

- 4.Bornemisza P, Suci I. Effect of cigarette smoking on the blood glucose level in normals and diabetics. *Med Interne.* 1980 Oct-Dec;18(4):353-6.
- 5.Mathur RK. Role of diabetes, hypertension, and cigarette smoking on atherosclerosis. *J Cardiovasc Dis Res.* 2010 Apr-Jun; 1(2): 64–68.
- 6.Tonstad S. Cigarette smoking, smoking cessation, and diabetes. *Diabetes Res Clin Pract.* 2009 Jul;85(1):4-13
- 7.Haire-Joshu D, Glasgow RE, Tibbs TL. Smoking and diabetes. *Diabetes Care.* 1999 Nov;22(11):1887-98.
- 8.Sairenchi T, Iso H, Nishimura A, Hosoda T, Irie F, Saito Y, et al. Cigarette smoking and risk of type 2 diabetes mellitus among middle-aged and elderly Japanese men and women. *Am J Epidemiol.* 2004 Jul 15;160(2):158-62.
- 9.Maddatu J, Anderson-Baucum E, Evans-Molina C. Smoking and the risk of type 2 diabetes. *Transl Res.* 2017 Mar 6. pii: S1931-5244
- 10.Benbow SJ, Williams G, MacFarlane IA. Smoking habits and painful diabetic neuropathy. *J Diabetes Complications.* 1997 Nov-Dec;11(6):334-7.
- 11.Chiang CH, Lu CW, Han HC, Hung SH, Lee YH, Yang KC, et al. The Relationship of Diabetes and Smoking Status to Hepatocellular Carcinoma Mortality. *Medicine (Baltimore).* 2016 Feb;95(6):e2699.
- 12.Gupta N, Gupta ND, Garg S, Goyal L, Gupta A, Khan S, et al. The effect of type 2 diabetes mellitus and smoking on periodontal parameters and salivary matrix metalloproteinase-8 levels. *J Oral Sci.* 2016;58(1):1-6
- 13.Clair C, Cohen MJ, Eichler F, Selby KJ, Rigotti NA. The Effect of Cigarette Smoking on Diabetic Peripheral Neuropathy: A Systematic Review and Meta-Analysis. *J Gen Intern Med.* 2015 Aug;30(8):1193-203
- 14.Schipf S, Schmidt CO, Alte D, Werner A, Scheidt-Nave C, John U, et al. Smoking prevalence in Type 2 diabetes: results of the Study of Health in Pomerania (SHIP) and the German National Health Interview and Examination Survey (GNHIES). *Diabet Med.* 2009 Aug;26(8):791-7
- 15.Walsh CH, Wright AD, Allbutt E, Pollock A. The effect of cigarette smoking on blood sugar, serum insulin and non esterified fatty acids in diabetic and non diabetic subjects. *Diabetologia.* 1977 Sep;13(5):491-4.
- 16.Uchimoto S, Tsura K, Hayashi T, Suematsu C, Endo G, Fuzii S et al. Impact of cigarette smoking on the incidence of type 2 diabetes mellitus in middle-aged Japanese men. *The Osaka Health Survey. Diabet Med* 1999; 16: 951-5.

17.Jansen L, Berntop K, Hanson M, Lindell SE, Trel E. Glucose tolerance and smoking: a population study of oral and intravenous glucose tolerance tests in middle-aged men. *Diabetologia* 1983; 25: 86-8.

18.Frati AC, Iniestro F, Arizo CR. Acute effects of cigarette smoking on glucose tolerance and other cardiovascular risk factors. *Diabetic Care* 1996; 19: 112.

19.Manson JE, Ajani VA, Liv S, Nathan DM, Heunekens CH. A prospective study of cigarette smoking and the incidence of diabetes mellitus

among US male physicians. *Am J Med* 2000; 109: 538.

20.Rimm EB, Manson JE, Stampfler MJ, Coldit GA, willet WC, Rosner B et al. Cigarette smoking and risk of diabetes in women. *Am J Public Health* 1993; 83: 211-4.

21.Shimokata H, Muller DC, Andes R. Studies in the distribution of body fat III. Effects of cigarette smoking. *JAMA* 1989; 261: 1169.

22.Wannamethee SG, Shaper AG, Perry IJ. Smoking as a modifiable risk factor for type 2 diabetes in middle-aged men. *Diabetes Care* 2001; 24:1590-5.