INTERNATIONAL JOURNAL OF FOOD AND NUTRITIONAL SCIENCES

IMPACT FACTOR ~ 1.021

Official Journal of IIFANS

Research Paper   *Open Access*

BEHAVIOURAL RISK FACTORS IN DIABETIC PATIENTS ATTENDING A TERTIARY HOSPITAL

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ABSTRACT

Among the increasing burden of non communicable diseases diabetes mellitus is emerging as a potential threat. Behavioural risk factors exert significant influence on occurrence and progression in diabetes mellitus. With this background this study was undertaken to assess behavioural risk factors of diabetic patients attending a tertiary hospital. This study was undertaken on diabetic subjects attending Endocrinology Out Patient Department, Sir Sunderlal Hospital. A predesigned and pretested proforma was used to elicit desired information after taking consent from subjects. Information pertaining to behavioural risk factors in them was obtained by interview technique. Nearly half of the subjects were in age group 41 to 50 years. Majority (87.6%) had no addiction and 76.4% subjects had at least one complication. In all regular diet, physical activity and weight reduction were considered for diabetic control by 88.4%, 44.5% and 24.4% subjects, respectively. Only 31.7% subjects were found physically active and 43.5% subjects decreased their diet after diagnosis of diabetes. Food frequency analysis revealed significant qualitative deficiencies in the diet of diabetic subjects. Behavioural risk factors related information of diabetic patients had been far from being satisfactory. Therefore counselling pertaining to reduction of behavioural risk factors should be inbuilt strategy of diabetic management plan.

INTRODUCTION

Non Communicable Diseases (NCDs) are the leading cause of death in the WHO South-East Asia region. The increasing burden of NCDs is attributed to population aging, rapid and unplanned urbanization and negative effect of globalization. In this region NCDs accounts for 55% of all the deaths. NCDs claim lives at younger age in the south-East Asia region compared to other WHO regions. (WHO, 2013).Among NCDs diabetes is emerging as a potential threat. According to global estimate the number of cases of diabetes worldwide will rise to 366 million by 2030 and India with 79.4 million cases will rank as number one in terms of absolute number of diabetes (Wild et al, 2009).However, as per estimate of International Diabetes Federation (IDF) in the year 2012 the estimated number of diabetics in India in 2030 would be 101.2 million (Ramchandran et al, 2006).

The vision for action plan for the prevention and control of NCDs in South East Asia (2013-2020) is that all people of this region to enjoy the highest attainable status of health, wellbeing and quality of life at every age, free of preventable NCDs, avoidable disability and premature death(WHO,2013). Strategic action areas for prevention and control for NCDs in general and diabetes mellitus in particular at primary, secondary and tertiary institution level revolve around health promotion and risk reduction as well as systems strengthening for early detection and management.

Major proportion of overall morbidity of diabetes mellitus in South East Asia region is accounted by India. According to a recent estimate from a nation wide multi centric surveillance study on diabetes mellitus type 2 in urban areas the prevalence of type 2 disease was 7.3%(Mohan et al, 2008)**.**Several studies carried out in different cities of India revealed high prevalence of diabetes mellitus(Ramchandran et al,2001,2006,2008)

Diabetes per se can lead to adverse complications. However, presence of other NCDs (eg. hypertension, obesity etc.) can potentiate the occurrence of adverse consequences. Persistence of behavioural risk factors (smoking, unhealthy dietary practices) can exert significant influence on progression of diabetes mellitus. With this background this study was contempeted in a tertiary hospital of central India on diabetic patients with the primary objective of assessing information pertaining to behavioural risk factors, physical activity/exercise, dietary practices, and dietary diversity of diabetic patients.

MATERIAL AND METHODS

SETTING

This study was conducted at Sir Sunder Lal hospital affiliated to Institute of Medical Sciences, Banaras

Hindu University, Varanasi, India. It is the only Tertiary Care Hospital in the Eastern Uttar Pradesh (UP) providing medical coverage to more than 150 million populations in the vast catchments areas of Eastern UP, Western Bihar and adjoining areas of Madhya Pradesh and Nepal. It also caters for the medical and health needs of University Employees, their families and university students and serves as premier referral hospital for other private hospitals.

STUDY SAMPLE

Diabetic Patients >30 years of age attending a tertiary hospital were considered as subjects of the study.

SAMPLE SIZE

Assuming 70% of subjects will be with at least one behavioural risk factor and taking permissible level of error at 7.5% the sample size worked out to be 144. Giving allowance to the extent of 10% for noncompliance the required sample size was rounded to 158.

SAMPLING METHODOLOGY

All confirmed cases of diabetes mellitus attending Out Patient Department (OPD) of Endocrinology at Sir Sunder Lal Hospital, Institute of Medical Sciences, and Banaras Hindu University Varanasi were selected consecutively. Serious patients and patients with unwillingness to participate in the study were not included in the study.

APPROVAL OF THE STUDY AND CONSENT OF PARTICIPANTS

The study had prior approval of the academic authorities of Banaras Hindu University Varanasi, India and participants were explained about the purpose of the study and their consent was obtained for participation in the study.

TOOLS OF THE STUDY

A predesigned and pretested proforma was used to elicit desired information. The interview schedule comprised three sections [A] General profile of the participants [B] Information pertaining to behavioural risk factors viz. tobacco and alcohol consumption and knowledge regarding physical Activity/exercise [C] Dietary Practices and dietary diversity of the patients.

TECHNIQUE OF THE STUDY

Information pertaining to socio demographic characteristics was obtained by interviewing subjects using predesigned and pretested proforma. They were specifically interviewed about duration of the disease, presence of family history of disease and associated complications. Their opinion regarding risk of mortality by presence of hypertension as co morbidity was also sought. Their knowledge about different approaches/methods to control diabetes was obtained by interview method. They were interviewed for the presence of behavioural risk factors viz. Tobacco and alcohol consumption. The detailed information regarding physical Activity/ exercise performed by subjects were elicited by using same tool and technique. In order to elicit information pertaining to

dietary practices and dietary diversity subjects were interviewed using the same tool.
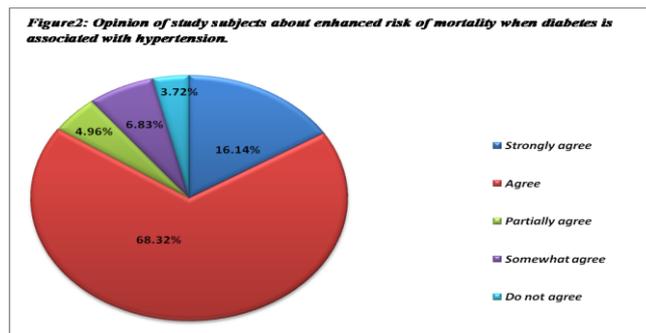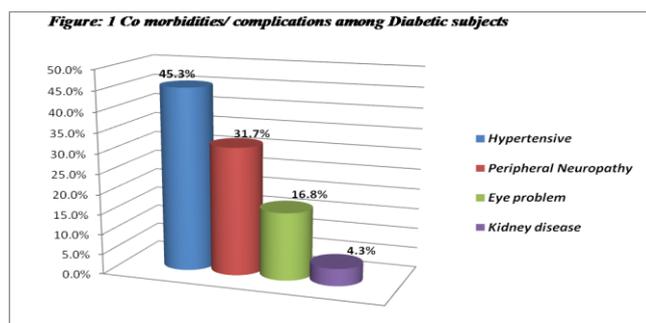
ANALYSIS OF THE DATA

Data thus obtained were entered in personal computer; appropriate tables and figures were generated using SPSS. Z test was applied to find out significance between two proportions.

RESULTS

Socio demographic characteristics of 161 subjects are given in table 1. In case of 53.4% subject's age was $\leq$ 50 years and 10.6% subjects were > 60 years of age. Eighty nine (55.3%) subjects were female. Seventy (43.5%) subjects were illiterate. Educational level was graduation and above in 19.3% subjects. Out of 89 female subjects 82 (92.1%) were primarily engaged in domestic work. Primary occupation of 14.9% and 18.6% subjects was business and service, respectively. In case of 55.9% subject's residential status was rural.

Majority (87.6%) subjects had no addiction; tobacco and alcohol consumption was present in 12.4% and 6.2% subjects, respectively. History of diabetes mellitus was present in 28% subjects. In all 47.2% subjects had glycemic control; corresponding value for male and female subjects were 43.1% and 50.6% (Z=0.95; p>0.05). Out of total subjects 123(76.4%) had at least one complication. subjects with one, two and three complications were 92(57.1%), 27(16.8%), 4(2.5%) respectively (Table 2). In all hypertension peripheral neuropathy, eye problem, and kidney disease were present in 73(45.3%), 51(31.7%), 26(16.8%), 7(4.3%), respectively (figure 1). However, of the subjects with co morbidity/complications (i.e.123) 59.3%, 41.5%, 21.1%5.7% and 0.8% had hypertension, peripheral neuropathy, eye problem, kidney disease, respectively.

As much as 16.1% subjects strongly agreed, with the statement that diabetes with hypertension has enhanced morbidity; subjects with response as agreed were 68.3 % (figure 2).

Figure: 1 Co morbidities/ complications among Diabetic subjects

Figure2: Opinion of study subjects about enhanced risk of mortality when diabetes is associated with hypertension.

Approaches/methods to control diabetes mellitus suggested by study subjects are given in table 3. Diet, physical activity and weight reduction as exclusive approach for diabetes control were stated by 50.3%, 6.8% and 4.4% subjects, respectively. Diet and physical activity together were considered by 20.5% subjects whereas 14.9% subjects considered all the three approaches to control diabetes mellitus. In all regular diet, physical activity and weight reduction were considered for diabetic control by 88.8%, 45.3% and 22.4% subjects, respectively.

As much as 54.7% subjects expressed diabetic control is necessary for undertaking exercise and 40.4% subjects decreased their physical activity after confirmation of diabetes. Only 31.1% subjects were found physically active; most of them (94%) performed aerobic and 6% performed anaerobic exercise.

Seventy (43.5%) subjects decreased their diet after diagnosis of diabetes. As much as 43.5%, 44.1% and 12.4% subjects were vegetarian, non vegetarian and eggatarian, respectively. In case of majority of subjects frequency of meal was 3-4. Irregular pattern of meal was practised by 37.9% subjects (table 4).

Information regarding dietary diversity of study subjects is given in table 5 Fruits were regularly consumed by 15.5% subjects whereas this was irregular in 43.5% cases. Vegetable consumption was almost universal (98.1%) and 77.0% subjects consumed green leafy vegetables as well. Salads were consumed by 86.3% subjects and in case of 23.0% this was done on regular basis. Nearly 3 out of 10 subjects consumed fast food. Majority (80%) subjects consumed fried food.

Table 1: Socio demographic characteristics of Study Subjects:

Particulars	Number	Percentage
Age		
<40	11	6.8
41-50	75	46.6
51-60	58	36
61-70	14	8.7
>71	3	1.9
Sex		
Male	72	44.7
Female	89	55.3
Education		
Illiterate	70	43.5
Primary	23	14.3
High school	21	13
Intermediate	16	9.9
Graduation& above	31	19.3
Occupation		
Agriculture	14	8.7
Business	24	14.9
Service	30	18.6
Professional	4	2.5
Retired	7	4.3
House wife	82	50.9
Area of Residence		
Rural	90	55.9
Urban	71	44.1

Table 2: Co morbidity/complication among subjects

Particulars	Number	Percentage
No Complication	38	23.6
Hypertension	42	26.1
Peripheral neuropathy	35	21.7
Eye Problem	11	6.8
Kidney Disease	3	1.9
Autonomic neuropathy	1	.6
Eye problem and hypertension	11	6.8
Hypertension+Peripheral neuropathy	16	9.9
Kidney+hypertension+eye problem	4	2.5
Total	161	100

Table: 3 Approaches/ Method to control diabetes mellitus

Particulars	Frequency	Percentage
Diet	81	50.3
Physical activity	11	6.8
Weight reduction	7	4.3
Diet and Physical activity	33	20.5
Diet + physical activity and weight Reduction	24	14.9
Diet+ physical activity+ weight Reduction and avoid marriage in diabetic family.	5	3.1

Table 4: Dietary practices and habits of study subjects:

Particular	Number	Percentage
Changes observed in diet after diabetes		
Decreased	70	43.5
Increased	32	19.9
Same	59	36.6
Nature of Diet		
Vegetarian	70	43.5
Non vegetarian	71	44.1
Eggaterian	20	12.4
Frequency of meal		
2	8	5.0
3-4	145	90.1
≥ 4	8	5.0
Pattern of meal		
Regular	100	62.1
Irregular	61	37.9

Table 5: Dietary diversity of study subjects

Food (Consumed)	Regular	Irregular	Never
Fruits	15.5	43.5	41.0
Vegetables	63.4	34.7	1.9
Salads	23.0	63.3	13.7
Sweets	-	49.1	50.9
Sugar/candy	-	12.4	87.6

Jaggery	.6	47.8	52.2
Corn flakes	1.9	4.9	93.2
Potato	19.9	52.1	28.0
Bread(white)	5.0	57.1	37.9
Rice(white)	11.2	60.2	28.6
Fast Food	.6	28.6	70.8
Dried fruits	3.1	27.3	69.6
Cake	-	23.0	77.0
Fried Food	-	80.1	19.9
Sweetened juice	-	3.1	96.9

DISCUSSION

Perusal of socio demographic characteristics of study subjects reveals that diabetes mellitus occurs at young age as evidenced by its occurrence in nearly 50% of the cases before 50 years of age (table1) and this is also more in female. Much significance to the findings related to literacy level, place of residence cannot be accorded as this is a hospital based study. However, it is apparent that majority of diabetics were sedentary on activity scale.

Tobacco and alcohol consumption in diabetic subjects has been lower than the general population (IIPS, 2005). This could be due to modification in their behavioural risk factors including tobacco and alcohol consumption. The consumption of these substances has been less than the reported figures in other studies (Ilhan et al, 2002; Kutty et al, 1993; Silacy et al, 1993).The metabolic effects of alcohol and relationship of alcohol intake to diabetes mellitus are complex. It is reported that excessive alcohol consumption can increase the risk of type 2 diabetes mellitus.

Positive family history of diabetes has been considered as an independent risk factor. Mohan et al (2003) reported that subjects with positive history of diabetes have five times greater prevalence of glucose intolerance compared to subjects without family history of diabetes mellitus. It has been more than the figure reported by Ramchandran et al (2001). Only four out of ten subjects were in glycemic control and this has been similar in male and female subjects. This clearly reflects that therapeutic, dietary and life style approaches adopted were not able to achieve the goal of glycemic control in 60% of cases; This is further corroborated by the observation that majority of the subjects had at least one complication/ co morbidity. Presence of neuropathy in three out of ten subjects it of serious concern (table 2, "figure 1"). Elevation of blood pressure is associated with increased risk of developing diabetes (Ahuja et al, 1979).However, contrary to this there appears to be higher incidence of hypertension in people with type 2 diabetes. In fact insulin resistance is not the cause of hypertension but does contribute to progression as observed by Gupta et al (2003). In this study also hypertension has been co morbidity in significant proportion of diabetics. Presence of these conditions together enhances risk of mortality; nearly eight out of ten subjects agreed with this statement. It means that person with these two conditions can be amenable to therapeutic, dietary and life style approaches.

In the past conventional diabetic therapy in individuals with type 2 diabetes mellitus primarily focused on single risk factor management such as achieving the absence of symptoms attributable to hyperglycaemia. However, later on focus shifted on achieving biomedical targets for multiple risk factors primarily glyceamic control, hypertension and dislipidemia. Multi factorial interventions combined drug therapy with behavioural modifications (viz. Diet and physical activity). It is interesting to note that 9 out of 10 subjects realize the importance of dietary management in diabetic control. Nearly half of the subjects put emphasis on physical activity and two out of ten subjects considered weight reduction for controlling diabetes mellitus. The role of genetic factor was poorly understood by the study subjects as nearly one out of twenty considered avoidance of marriages between two diabetic families (table 3)

Exercise improves blood sugar control and this effect is evident even without weight loss. It improves reaction to insulin and decreases blood lipids. Importance of exercise was known to only half of the subjects; unfortunately four out of ten subjects decrease their physical activity after confirmation of diabetes. Only three out of ten subjects were physically active. It is understandable that due to paucity of time care providers are not able to put enough emphasis on exercise.

Dietary practices (table 4) and Dietary diversity (table 5) of study subjects emphasises on optimal dietary management of diabetics. The impact of globalization and urbanization is visible in the dietary diversity of study subjects. Fast foods and many other unhealthy dietary items (viz. Dry fruits and fried foods) have got place in the dietetics of diabetic patients.

Thus there is need and scope for effective dietary management, physical activity, weight reduction and genetic counselling. These are key to success for prevention and control of non communicable disease in general and diabetes mellitus in particular.

CONCLUSION

Behavioural risk factors related information of diabetic patients had been far from being satisfactory. Deficiencies prevailed in all the three approaches (viz. Dietary management, physical activity and weight reduction) of diabetic management. Therefore counselling pertaining to reduction of behavioural risk factors should be inbuilt strategy of diabetic management plan.

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