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REGISTRY BASED STUDY OF TYPE2 DIABETES MELLITUS INDIVIDUALS ATTENDING EXCEL CENTRE, GUWAHATI

Community Medicine

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ABSTRACT

Introduction: Presently India has a huge burden of diabetes which is going to increase significantly in future. Appropriate use of diet and exercise can improve insulin sensitivity and glycemic control and decrease the need for oral medications or insulin.

Objectives: To assess the compliance of adherence to proper dietary habits and physical activity by T2DM patients using a novel compliance and adherence scoring (CAS) system and to assess the correlation between such a novel scoring system and the glycemic status.

Methodology: Clinic registry based retrospective cross sectional study conducted in the Diabetes care unit of a tertiary referral centre. Data regarding age, sex, educational level, occupation, HbA1c of T2DM patients aged above 20 years were collected from clinic data base for the period of one year starting from January 2011. Interview based CAS was also obtained for dietary habits and physical activity. Full confidentiality of records was maintained considering the ethical issues. Statistical analysis was done by using percentage, mean, and Chi-square test wherever applicable.

Results: The analysed data set comprised of 573 patients with T2DM (Male: 58%; Female: 42%). Significant association was found between optimal HbA1C (<7%) level and higher CAS for physical activity ($P<0.05$) but it was not significant in dietary habits ($p>0.05$).

Conclusions: Our unique CAS to assess compliance and adherence in taking part in proper physical activity has significant association with optimal glycemic status as indicated by achievement of HbA1c goal of <7% by the studied patients with T2DM. Though the association was not significant for dietary habit, future study including a larger cohort may provide the right answer.

KEYWORDS

Diabetes Mellitus, Dietary Habit, Physical activity, Glycemic status

INTRODUCTION:

Presently India has a huge burden of diabetes which is going to increase significantly in future. The International Diabetes Federation (IDF) has estimated the current diabetic population at 40.9million in India and which is projected to rise further to 69.9million by the year 2025. [1]. The prevalence of type 2 diabetes mellitus in Guwahati, NE India, was 8.2%. [2]

In the treatment strategy for adults with Type 2 diabetes Diet and exercise play important role. Appropriate use of diet and exercise can improve insulin sensitivity and glycemic control and decrease the need for oral medications or insulin. [3, 4] Although there is some controversy over the optimal diet for adults with type 2 diabetes, there is a consensus to increase consumption of fruits and vegetables and decrease daily consumption of saturated fats [5, 6, 7]. Regular, moderate-intensity physical activity for 30 min at least 5 times per week is recommended for most Americans [8]. An easy to use and reproducible tool to examine knowledge, attitude, compliance and adherence to diet and exercise can go a long way in improving diabetes care.

Objectives:-

1. To assess the compliance of adherence to proper dietary habits and physical activity by T2DM patients in an objective manner using a novel compliance and adherence scoring (CAS) system.

2. To assess the association between such a novel scoring system and the glycemic status as indicated by point of care Glycated hemoglobin(HbA1c) of the same cohort of T2DM patient.

METHODOLOGY:

This clinic registry based retrospective cross sectional study was conducted in the Diabetes care unit of Excel Centre (an initiative of Excel care Hospitals), based at Guwahati and catering to the entire North East India in its capacity as a tertiary referral center for Diabetes and Endocrinology. Permission was taken from the authority of the hospital for the study. All patients who had a confirmed diagnosis of T2DM, and aged above 20 years, and registered in the database during the period of one calendar year starting from 1st January 2011. The following variables were extracted from the clinic database for inclusion in this study: [1] educational level, [2] occupation, [3] age, [4] sex, [5] HbA1c. As a routine policy of the department, all patients are awarded with a compliance and adherence score by a trained paramedical staff comprising of diabetes educator or counselor or dietician through an extensive interview with regard to patients' attributes towards (a) proper diet, and (b) physical activity. The breakup of the CAS process is shown in the table 1.

Table 1: A break-up of compliance and adherence scoring (CAS) system

Awarded score	Patient Attributes
1	Inadequate knowledge + Inadequate compliance
2	Adequate knowledge + Inadequate compliance
3	Adequate knowledge + Adequate compliance

Statistical analysis was done by using Percentage, Mean, and Chi-square test and data has presented as tables, bar diagrams, and Pie diagrams wherever applicable.

RESULTS:

Variables of 573 Type 2 Diabetes mellitus patients were collected and analyzed. Patients were classified according to their HBA1C level for analysis.

Table 2: Age and sex distribution of Type 2 DM patients

Variables		HBA1C		Total (%)
Age (in years)		<7 (%)	≥7 (%)	
	20-40	7 (10)	49 (9.74)	56 (9.77)
	40-60	32 (45.71)	309 (61.43)	341 (59.51)
	>60	31 (44.29)	145 (28.82)	176 (30.72)
Sex				
	Male	43 (61.43)	292 (58.05)	335 (58.46)
	Female	27 (38.57)	211 (41.95)	238 (41.54)
Occupation				
	Homemaker	17 (24.29)	146 (29.03)	163(28.44)

	Business	8 (11.42)	91 (18.09)	99 (17.27)
	Service-holders	44 (62.86)	262 (52.09)	306 (53.40)
	Cultivation	1 (1.43)	3 (0.59)	4 (0.69)
Education				
	Illiterate	1 (1.03)	12 (2.38)	13 (2.27)
	Primary level education	4 (5.71)	44 (8.75)	48 (8.38)
	Secondary level education	15(21.43)	113 (22.46)	128 (22.33)
	Higher Secondary level education	6 (8.57)	75 (14.91)	81 (14.03)
	Graduate	29 (41.43)	221 (43.94)	250 (43.63)
	Post Graduate	14 (20)	35 (6.96)	49 (8.55)
	Post Doctoral	1 (1.03)	3 (0.59)	4 (0.69)

Out of 573 patients, 335 (58.46%) were males and 238 (41.54%) were females. Highest numbers of patients (59.51%) were found in the age group of 40-60 years for both sexes followed by > 60 years of age group.

Fig 1: Distribution of patients according to age and sex

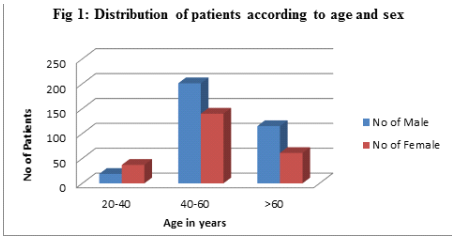
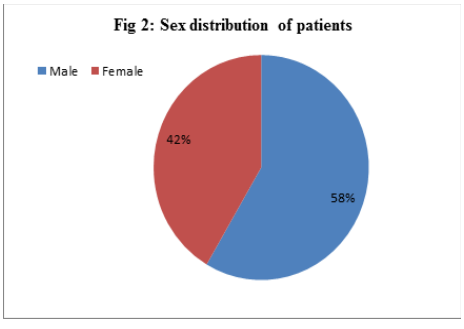


Fig 2: Sex distribution of patients



Most of the affected patients (53.40%) are service-holders followed by Homemaker (28.44%). Graduation completed individuals affected more (43.63%) whereas PhD holders are affected least (0.69%).

Table 3: Distribution of patients according to CAS for Physical activity and HBA1C level

CAS for Physical activity	HbA1C		Total (%)
	<7 (%)	≥7 (%)	
1	19 (27.14)	159 (31.61)	178 (31.06)
2	47 (67.14)	341 (67.8)	388 (67.72)
3	4 (5.71)	3 (0.59)	7 (1.22)
Total	70 (12.22)	503 (87.78)	573 (100)

CAS: Compliance and adherence scoring

5.71% of patients had HBA1C <7 and 0.59% of patients had HBA1c ≥7 whose exercise score is 3. This difference was found to be statistically significant ($p<0.05$).

Table 4: Distribution of patients according to CAS for Dietary practices and HbA1C level

CAS for Dietary Practices	HbA1C		Total (%)
	<7 (%)	≥7 (%)	
1	4 (5.71)	48 (9.54)	52 (9.07)
2	63 (90)	445 (88.47)	508 (88.66)
3	3 (4.29)	10 (1.99)	13 (2.27)
Total	70 (12.22)	503 (87.78)	573 (100)

CAS: Compliance and adherence scoring

4.29% of patients had HBA1C <7, while 1.99% of patients had HBA1C ≥7 whose diet score is 3. Though there is a positive association but this difference was found to be statistically insignificant ($p>0.05$).

DISCUSSION:

Most of the patients are in the age group of 40-60 years followed by >60 years. Karin M. Nelson et al also found mean age of 61 years in majority of the type 2 diabetes patients [9]. Out of 573 patients, 335 (58.46%) were males and 238 (41.54%) were females.

Most of the affected patients (53.40%) are service-holders and cultivators are affected least (0.69%). These differences may due to lack of physical activities among service holders than cultivators.

Significant association was found between physical activities and glycemic status among type 2 diabetes individuals. Daniel O Clark in his study also found association of physical activities and decreased incidence of type 2 diabetes mellitus [10].

Though association was found between dietary practices and glycemic status among type 2 diabetes individuals but it was insignificant. Michael J. Fowler in his study found association of dietary practices and glycemic status among type 2 diabetes individuals. [11].

CONCLUSION: Our unique CAS to assess compliance and adherence in taking part in proper physical activity has significant association with optimal glycemic status as indicated by acheivement of HbA1c goal of <7% by the studied patients with T2DM. Though the association was not significant for dietary habit, future study including a larger cohort may provide the right answer.

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