Original Article

AN OBSERVATIONAL STUDY ON MEDICATION ADHERENCE AND PREVALENCE OF COMPLICATIONS IN TYPE 2 DIABETES MELLITUS PATIENTS

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ABSTRACT

Objective: Diabetes is a complex heterogeneous disorder with chronic multiple illness which needs continuous medical management. Along with the medication life style modifications (diet, exercise) and patient self-management education is necessary not only for glyceamic control but also for prevention and delay of acute and long term complications. In this regard an observational study was carried out among 167 type 2 diabetic patients using a self-administered questionnaire in tertiary care hospital, Guntur.

Methods: Patients of both genders in the age of 30-89 with co morbidities were included in the study. Data regarding social habits, medication and adherence, duration of diabetes, co-morbidities, presence of diabetic complications along with the prevalence of complications while practicing regular diet, exercise with medical adherence was collected and evaluated.

Results: Among 167 patients 64.64 % were male and 35.36% were female. 14.4% of the populations are with diabetes from more than 17years. 65.3% of the patients don't have alcoholic and smoking habit. Only 51.5% of the population was adherent to the medications. Hypertension is major co-morbidity existing among them. 82% of the study population reported macro vascular complication. The periodic prevalence rate(1-5years) of complications in type 2 diabetic patients who are adherent to medications and life style modifications was found to be 11.4% and the periodic prevalence rate of complications in patients who are either non-adherent to medications or life style modifications was 88.6%.

Conclusion: Medical and life style adherence is strongly recommended which also must be promoted by conducting awareness programme and health care camps with continuous supervision by the family members over patients for healthy society.

Keywords: Diabetic complications, Life style modifications, Medication adherence, Type 2 diabetes mellitus

INRODUCTION

Diabetes mellitus, one of the very familiar worldwide metabolic disorder is one of the oldest disease. From the period it was identified the rate at which people suffering with it has been increasing irrationally [1]. Diabetes mellitus is a group of metabolic disorders identified by chronic hyperglycemia that results because of defects in either insulin secretion or action or both. Metabolic abnornamilities are seen in the persons affected by diabetes. Severity of symptoms is due to the type and duration of diabetes. Few of the patients are asymptomatic especially in the case of type 2 diabetes during the early years of disease. Improper attention towards the maintenance of insulin levels may lead to stupor, coma and even to death [2].

According to international diabetes federation 2019at present 463 million people are estimated to be living with diabetes [3]. One of the major contributing factors for up surge of Type 2 Diabetes is poor medical adherence [4, 5]. The optimum therapeutic goal in diabetes patients is achieved by individualized care for each patient by considering mortality, morbidity, quality of life, prevention and delay of co morbidities, diet, exercise, glycemic control as outcomes [6, 7]. There are more chances of occurring complications in patients with non-adherence to medicine when compared to patients adhering to medication, diet control and regular exercise which indicates. Improving medication adherence associated with change in life style is necessary for maintenance of good health for long period especially in case of diabetic patients. Hence this study aims at assessing the level of medication adherence and life style modification in prevention and delay of complications in type 2 diabetic mellitus patients.

MATERIALS AND METHODS

The current study was an observational study in which medication adherence in type 2 diabetic patients using a self-administered questionnaire. The questionnaire was prepared using information and thorough review from the literature survey and factors used in previous studies. The study was carried out in a tertiary care hospital over a period of six months. Questionnaire was filled during direct interaction with the patient with their consent. The score obtained was categorized into 1-3 as non-adherent and 4-5 as adherent. The medication adherence, life style modifications and complications were analyzed. The data was analyzed using multiple regression analysis to find the relation between medication adherence, dietary control and exercise in the prevalence of complications. The internal consistency in the questionnaire was validated through cronbach's alpha value and it was found to be 0.84 which shows an acceptable internal consistency and the sample size for the calculation of cronbach's alpha value was found out using Bonett's formula [8, 9]. A total of 167 patients were included in the study.

Inclusion criteria

Patients of both genders diagnosed with type 2 diabetes using hypoglycaemic agents and with co-morbido conditions are included in the study.

Exclusion criteria

Patients on temporary hypoglycaemic medication during hospital stay and gestational diabetic patients were excluded from the study.

RESULTS AND DISCUSSION

A total of 167 patients were included in the study. Among those, 108 patients were males and 59 females. The majority of the participants belonged to the age group of 30 to 89. The mean age of the population was 58.75. The data collected was significant with a p value of 0.00001 at 0.05level of significance and the standard deviation (SD) was 21.6. 52.1% of study population was reported

with family history of diabetes. Table 1 indicates the age distribution and diabetes duration. Majority of the study population are above 50 y and has been suffering with diabetes since 4 y. 14.4% of the populations are with diabetes from more than 17y.

Table 1: Age distribution and diabetic duration

Age	Percentage (%)
30-39	1.79
40-49	20.95
50-59	28.74
60-69	31.73
70-79	14.97
80-89	1.79
Duration of diabetics	
1-4 y	35.3
5-8 y	28.7
9-12 y	10.2
13-16 y	11.4
≥17 y	14.4

Table 2 indicates social habits of the patients. Both smoking and consumption of alcohol are risk factors for development of cardiac complications in type 2 diabetes patients among the total population 38 male patients were found to be both smoker and alcoholic, 10 patients were found to be alcoholic, 8 patients were found to be smoker and among female patients 2 were found chewing tobacco. 65.3% of the patients don't have alcoholic and smoking habit which indicates one step a head than others for better health.

**Table 2: Social habits of study population**

Social habits	Percentage (%)
Non-smoker/non alcoholic	65.3
Both smoker and alcoholic	22.7
Alcoholic	5.99
Smoker	4.79
Tobacco	1

Table 3 indicates medication and its adherence among the study population. 51.5% of the population was adherent to the medications and remaining 48.5% of the population were non-adherent due to lack of knowledge on importance of medication adherence, carelessness, social support, economic burden are the reasons mostly observed.
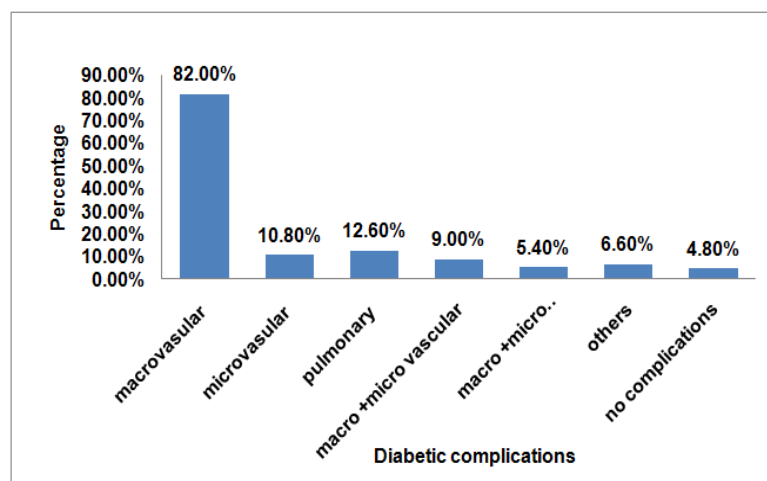
Table 3: Medication adherence of study population

Medication	Percentage
Oral hypoglycaemic	86.8
Insulin	2.4
Both	10.8
Monotherapy	8.4
Combination (total)	91.7
2 classes of drugs	65.3
3 classes f drugs	23.9
4 classes of drugs	2.4
Medication adherence	
Yes	51.5
No	48.5

Fig. 1 shows the presence of co-morbidities among population. Hypertension is major co-morbidity existing in them with 53.3% whereas thyroid problem is least occurring.
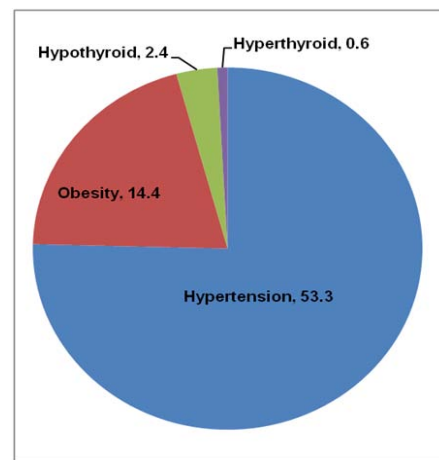
Fig. 1: Percentage of co morbidities among study population

Fig. 2 indicates the diabetic complications in the study population. Occurrence of complications are most common among diabetic patients who are non-adherent to medications and life style modifications in the present study we observed the prevalence of macrovascular, microvascular, pulmonary and other complications among the type 2 diabetic patients. 82% of the study population reported macro vascular complication.

Fig. 2: Prevalence of diabetic complications among study population

Table 4 gives distribution of prevalence time of complications in diabetic patients based on their adherence. Different parameters for adherence to medications prescribed, dietary control and exercise were considered and observed for onset time for prevalence of complications. It was found that 63% of diabetic patients who are adherent to medications and life style modifications the onset time of complications was ≥16years, those who are adherent only to medications but not life style modifications the onset of time for 34% of populations was 1-5 y and for those who are not adherent to both medications and life style modifications the onset time of prevalence of complications was 77% and those who adherent to life style modifications but non-adherent to medications the prevalence of complications is 1-5 y in 100% of the population. The periodic prevalence rate (1-5 y) of complications in type 2 diabetic patients who are adherent to medications and life style modifications was found to be 11.4% and the periodic prevalence rate of complications in patients who are either non-adherent to medications or life style modifications was 88.6%.

Table 4: Distribution of prevalence time of complications in diabetic patients based on their adherence

Parameters	1-5 Y	6-10 Y	11-15 Y	≥16 Y
Medication Adherence+Diet Control+Exercise	0%	10.53%	26.32%	63.16%
Medication Adherence+No Diet Control+No Exercise	34%	30%	20%	16%
Medication Adherence+Diet Control+No exercise	16.67%	50%	16.67%	16.67%
Medication Adherence+Exercise+No Diet Control	44.44%	22.22%	33.33%	0%
No Medication Adherence+No Diet Control+No Exercise	76.81%	13.04%	7.24%	2.90%
No Medication Adherence+Diet Control+Exercise	100%	0%	0%	0%
No Medication Adherence+No Diet Control+-Exercise	75%	25%	0%	0%
No Medication Adherence+No Exercise+Diet Control	71.43%	0%	29%	0%

From the data it is that observed majority of type 2 diabetic patients are non-adherent to prescribed medications and life style modifications which increases the chance of early onset time of complications which affects the individual quality of life, hospitalization, increased mortality rate and decreased rate of life expectancy. Adherence only to prescribed medications also has earlier onset of complications. Adherence to medications and life style modifications could delay the onset of complications to ≥16 y from the initial diagnosis of type 2 diabetes and improves the quality of life.

CONCLUSION

Diabetes is most prevailing life time health problem among people which cannot be recovered by medication alone for few days. Diabetes must be overcome by accepting modification in the daily life and adhering to the changes that were done along with the medication adherence. In the conducted study only few patients are in regular diet, exercise and medication. The reasons for non-adherence were unclear among most of them. Medical and life style adherence is strongly recommended which improves quality of life with decreases hospitalization and mortality rate and must be supported by the family members. The study also indicated need of awareness programme to be conducted for healthy society.

AUTHORS CONTRIBUTIONS

All the authors have contributed equally.

CONFLICTS OF INTERESTS

Declared none

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