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Evaluation of Targets Achieved, Quality of Care and Life in Type 2 Diabetes Mellitus Patients in a Tertiary Care Hospital.

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ABSTRACT

A prospective, Cross sectional observational study conducted in 200 Type2 diabetes patients attending outpatient department (OPD) of endocrinology. The objective was to assess various targets achieved according to ADA criteria, quality of life and quality of care. The study showed that approximately 71% of our patients achieved HBA1c target. Only 17.5% achieved blood pressure target and 66.6% of patients achieved LDL target. Our study showed that quality of care ranges from 48.5% for foot examination to 100% for HBA1c estimation. The mean score for Physical Component Score (PCS) and Mental Component Score (MCS) were both below 50. Our study shows that majority of type 2 diabetes patients treated at tertiary care hospital achieved target glycemic control and LDL control, but failed to achieve Blood pressure targets. Quality of care was poor for indicators like foot examination and quality of life scores were poor among our patients.

INTRODUCTION

Globally, the number of people with diabetes is expected to double between 2000 and 2030 while public awareness about this disease remains low [1,2,3]. Diabetes mellitus is a demanding disease that affects a person's health-related quality of life and person's ability to function [4,5]. People with diabetes are constantly reminded of the disease on a daily basis, they have to eat carefully, exercise, test their blood glucose and based on the result decide when to schedule their next meal or medication. Furthermore, they often have to stop and check for symptoms of hypo or hyperglycemia as well as deal with the fears of the possibility of complication of the disease [6]. Several studies have demonstrated that diabetes has a strong negative impact on the health-related quality of life (HRQOL), especially in the presence of complications [1]. Diabetes can compromise physical, psychological and social functioning and can negatively affect quality of life. Understanding how individuals weigh the quality of life associated with complications and treatments is important in assessing the economic value of diabetes care and may provide insight into treatment adherence [7]. Treatment of individual risk factors, such as blood pressure, cholesterol and glucose is effective and Outcomes might be improved if this approach were used early in the course of the disease [8,9]. The true impact of a successful medical intervention can be understood to largely reflect the degree to which said treatment has a positive influence on patients' immediate and/or future well-being [10]. By emphasizing the assessment of health-related quality of life (HRQOL) in medical research, health care providers are being subtly encouraged to give proper focus to patients' welfare [11]. Consequently, medical research and care is slowly becoming more patient-focused, and there is a growing appreciation of the patient's perspective on health, disease, and medical treatments. Diabetes complications are the most important disease-specific determinants of QoL. Diabetes complications negatively affect quality of life as do depression aging, obesity and hypoglycemia [11].

The American Diabetes Association (ADA) has established standards of care that are reviewed and updated annually in an effort to facilitate quality care and improve therapeutic outcomes for patients with diabetes [12]. Despite progress in the management strategies of T2DM, diabetes care remains suboptimal. Quality of diabetes care at a national level has documented an appreciable gap between the

recommended and the actual care received by patients with diabetes [13]. In a developing country like India cost of treatment remains the most important predictor of quality of care for patients with type2 diabetes [14].

There is substantial evidence that complications of diabetes can be delayed and quality of life for patients with diabetes can be improved through a combination of appropriate clinical management and self-care practices [15]. Annually, the American Diabetes Association (ADA) publishes clinical practice recommendations for diabetes care based on this body of evidence. However, a number of barriers that are patient oriented (e.g., financial limitations, transportation, and provider access), provider oriented (e.g., lack of knowledge of guidelines and lack of time with patients), and system oriented (e.g., lack of access to specialty care providers for referral) often impede delivery of high-quality diabetes care [15].

Diabetes can affect a person's quality of life. Quality of life may be thought of as a multidimensional construct incorporating an individual's subjective perception of physical, emotional, and social well-being, including both a cognitive component (satisfaction) and an emotional component (happiness.) [16].

Diabetes leads to diminished self-care, which in turn leads to worsened glycemic control, increased risks for complications, and exacerbation of diabetes overwhelms in both the short run and the long run. Thus, quality-of-life issues are crucially important, because they may powerfully predict an individual's capacity to manage his disease and maintain long-term health and well-being. There is now good evidence that, among people with diabetes, psychosocial factors such as depression are stronger predictors of medical outcomes such as hospitalization and death than are physical and metabolic factors such as presence of complications, body mass index, or HbA1c level [17].

Quality of life is also increasingly recognized as an important health outcome in its own right, representing the ultimate goal of all health interventions. More than 50 years ago, the World Health Organization stated that health was defined not only by the absence of disease and infirmity, but also by the presence of physical, mental, and social wellbeing [18].

Some studies report a positive association between high levels of perceived quality of life and good glycemic control and educational and counseling interventions designed to facilitate the development of diabetes-specific coping skills, can improve both glycemic control and quality of life in people with diabetes. There are various tools to measure quality of life in diabetes. SF questionnaire is one of the most validated questionnaire tools for accessing quality of life in various diseases [19]. The SF-12 is a multipurpose short-form with only 12 questions, all selected from the SF-36 Health Survey. SF-12 questionnaire has various components which will access both physical health score (PHS) and mental health score (MHS). Any score more than 50 is considered as normal. There are also online services which can be used for obtaining scores [20].

Regular reports on relevant indicators of healthcare and outcomes should be made publicly available and used as a basis for continuing improvements to care delivery. Information from monitoring and research is ineffective if it is not communicated [21].

Hence, the present study aims to look into glycemic control with various treatment modalities, treatment of associated dyslipidemia and hypertension, quality of care and quality of life type 2 diabetes patients.

Objectives

- To assess the targets achieved with various treatment modalities used in patients with type2 diabetes mellitus with associated comorbidities like hypertension and dyslipidemia.
- To assess the Quality of care and Quality of life in these patients

METHODOLOGY

Study type: Cross sectional observational study.

Study population: Type 2 diabetes patients attending outpatient department (OPD) of endocrinology at our tertiary care hospital.

Source of Data and sample size study period: The study was conducted in 200 patients attending the OPD of tertiary care Hospital, Bangalore, for a period of one year, Nov 2009- Oct 2010.

Method of collection of Data: Type 2 diabetes Patients attending the endocrinology OPD were interviewed and were selected for the study if the patients satisfied the criteria mentioned below.

Inclusion criteria

- Patients diagnosed with type2 diabetes mellitus for at least one year
- Both male and female patients.
- Age group of 30 to 65 years.
- Patients on regular follow up in OPD for a minimum of one year.

Exclusion criteria

- Patients attending the out patients department with diabetes related complication.
- Patients who are receiving treatment from other systems of medicine like Ayurveda, and homeopathy.

If the patients satisfied the above mentioned criteria, informed consent was taken and data was collected using a pilot tested pro forma. Data was collected for each patient such as name, age, gender, height, weight duration of disease, family h/o, personal history, habits. Data relating to various drugs used for the treatment of diabetes with duration and dosage. Latest available reports of FBS, PPBS and HBA1c were also recorded. Drugs used for treatment of associated hypertension and dyslipidemia. Blood pressure measurement done on the day of attending the OPD was noted. Serum lipid profile estimation details within last one year were obtained. If more than one report was available, the latest report was chosen. Quality of life was assessed by using a preformed SF 12 questionnaire. Quality of care was assessed by obtaining details regarding parameters assessed/recommended by the physician during last one year such as HBA1c measurement, Diagnosis and treatment of hypertension, Screening and treatment of dyslipidemia, Antiplatelet therapy, Coronary Heart Disease (CHD) Screening and Treatment (ECG), Nephropathy Screening and treatment, Retinopathy Screening and treatment, Neuropathy Screening and treatment and Foot care. Result analysis was done by using descriptive statistics.

RESULTS

Table 1: Baseline characteristics of the patients

Parameters	Frequency	Percentage
Age		
20-30	2	1
31-40	19	9.5
41-50	42	21
51-65	137	68.5
Gender		
Male	115	57.5
Female	85	42.5
Duration of disease		
1-5y	92	46
6-10y	56	28
11-15y	30	15
>15y	22	11
Co-morbidity		
Hypertension	120	60
Dyslipidemia	107	53.5
Hypertension+ Dyslipidemia	98	49

Table 2: Various drugs used in treatment of diabetes and glycemic control achieved

Parameters	Frequency	Percentage %
Oral hypoglycemic agents	156	78
Monotherapy	50	25
Two drugs	67	33.5
Three or more drugs	39	19.5
Insulin	44	22
Alone	5	2.5
Insulin with OHA	24	12
Insulin + Insulin	8	4
Two insulin's + OHA	7	3.5

Table 3: Glycemic control achieved according to ADA (American Diabetic Association) Guidelines

Target Achieved	Yes	No
Fasting blood glucose(<130mg/dl)	139(69.5%)	61(30.5%)
Post prandial blood glucose (<180mg/dl)	124(62%)	76(38%)
HbA1c <7%	142(71%)	58(29%)

Table 4: Blood pressure control targets achieved

Blood Pressure	Frequency	Percentage
<130/80	21	17.5
> 130/80	99	82.5

Table 5: Serum lipid level targets achieved

Serum lipid levels	Achieved	Not achieved
LDL (<100mg/dl)	48 (66.6%)	24 (33.3%)
Triglyceride (150mg/dl)	26 (36.1%)	46 (63.9%)
HDL (>50mg/dl-female >40mg/dl -male)	38(52.7%)	34 (47.2%)

Table 6: Quality of care in diabetes

Parameter	Yes	No
Documented HbA1c measurement last one year	200(100%)	0
Documented lipid profile measurement last one year	110(55%)	90(45%)
Documented BP measurement in every visit	194(97%)	6(3%)
Documented ECG done in last one year	146(73%)	54(27%)
Documented serum creatinine in last one year	136(68%)	64(32%)
Documented microalbuminuria in last one Year	102(51%)	98(49%)
Documented foot examination in last one Year	97(48.5%)	103(51.5%)
Documented retinal examination in last one year	156(78%)	44(22%)
Documented use of Antiplatelet therapy	184(92%)	16(8%)

Table 7: SF-12 Questionnaire results in 50 patients.

	Normal Score	Mean score	Highest score	Lowest score
Physical Component Score	>50	47.8	58.4	34.2
Mental Component Score	>50	45.3	62.4	31.2

RESULTS

Our study showed that majority of the patients is from the age group of 50–65 years and male: female ratio is 1.35:1. Hypertension was the most common co-morbidity in type 2 diabetes patients in our study (60%) followed by dyslipidemia (51.5%). (Table No 1) Around 78% of the patients are treated with oral hypoglycemic agents (OHA) as compared to 22% of patients being treated with insulin (table 2). Among the patients on OHA two drug regimens is the most common accounting for 33.5% followed by 25% of patients on monotherapy. Metformin was the most commonly used drug for monotherapy accounting to 74% of patients followed by glimeperide which was used in 22% of patients. The glycemic targets were achieved best in patients on insulin (79.54%) as compared to patients on OHA (67.94%) (Table 3) Only 17.5 % achieved blood pressure target of <130/80 mm of Hg. Among the patients with dyslipidemia 66.6% of patients achieved LDL targets while 52.7 and 36.1 % of patients achieved HDL and triglyceride targets respectively (Table-5). The quality of care assessment shows that 100% of patients had HBA1c level done in last one year and 97% of the patients underwent blood pressure measurement during their hospital visit. Around 73% underwent ECG during the last one year and 68% underwent serum Creatinine estimation during last one year. 51% underwent urine micro-albumin estimation, 48.5% underwent foot examination, and 78% underwent retinal examination during the last one year (table no 06). Quality of life assessment showed that mean physical component score is 47.8 and mean mental component score is 45.3 (table no 7)

DISCUSSION

It is suggested that targets of diabetes management are more likely to be achieved if the importance of protecting and improving QoL is recognised and monitored alongside biomedical outcomes such as blood glucose levels. Treatments for chronic disorders may damage QoL of patients even if they improve their health. In evaluating outcomes of diabetes care, it is essential to assess the impact of diabetes on QoL. It informs us not only about the patients' experience of living with the condition, but also shows us ways in which we could improve diabetes care. If QoL is made a target of clinical and research efforts and seen as at least as important as the target of improved health, we are more likely to achieve both. In a study conducted at the Postgraduate Institute of Medical Education and Research (PGIMER) in Chandigarh, India. The questionnaires were completed by 108 patients in Hindi and 102 patients in Punjabi. In India, it seemed that self-confidence is more generally affected by diabetes and family life is more negatively impacted. These aspects are seen as rather more important in India than in the United Kingdom.

In the present study, most patients were started with single drug and when they did not achieve glycemic control, were shifted over to two drug regimen. Only 22% of patients are on insulin though our institution is a tertiary care hospital. In our study 71% of patients achieved target HBA1c levels, while 69.5% and 62% of patients achieved FBS and PPBS targets respectively. In a study conducted at Delhi in primary care patients only 37% patients achieved target HBA1c [22]. In a study conducted by Abdul Basit et al in a tertiary care hospital only 18.7% of patients achieved tight glycemic control [23]. In a study conducted at a tertiary care hospital in Tunisia only 21.3% of patients achieved target glycemic control [24].

Further subgroup analysis showed that glycemic targets were achieved best in patients on insulin (79.54%) as compared to patients on OHA (67.94%). But there was no statistical significance between the two groups. This is similar to many other studies which also show that glycemic control is achieved better with Insulin. From this it can be inferred that physician should not hesitate to initiate insulin therapy because of various advantages like better glycemic control and better quality of life. Since our sample size only 200 cases further data may be required before considering early initiation of insulin therapy in type 2 diabetes patients.

Hypertension was the most common co-morbidity in type 2 diabetes patients in our study (60%) followed by dyslipidemia (51.5%). Angiotensin receptor blockers (ARB) and ACE inhibitors were the most commonly used drugs with 38 and 35% respectively. This is clearly in lines with ADA recommendations which recommend ARB s and ACE inhibitors as the first line of drugs for treatment of hypertension in diabetes.

Dyslipidemia was the second most common co-morbidity seen in our study group (53.5%). 70% of these patients were treated with monotherapy and 30% were treated with combination of drugs. Among the patients with dyslipidemia 66.6% of patients achieved LDL targets while 52.7 and 36.1 % of patients achieved HDL and triglyceride targets respectively In our study quality of care assessment shows that 100% of patients had HBA1c level done in last one year and 97% of the patients underwent blood pressure measurement during their hospital visit. This is clearly because all patients must undergo HBA1c measurement before meeting the endocrinologist in our hospital. All patients must undergo blood pressure measurement before meeting the consultant. 73% underwent ECG during the last one year and 68% underwent serum Creatinine estimation during last one year. 51% underwent urine micro-albumin estimation, 48.5% underwent foot examination, and 78% underwent retinal examination during the last one year. Our study shows that quality of care ranges from 48.5% for foot examination to 100% for HBA1c estimation. A study conducted by Jaco Voorham et al showed that diabetes care indicators are ranging from 76% for glycemic control, 58% for blood pressure testing and 67% for lipid control [25].

A similar study conducted by Grant R W et al in America shows that quality of care indicators like retinal examination (55.4%), foot examination (63.6%) and urine albumin screening (65.1%) were lower and were similar to our study [26]. In a study conducted by Harzallah et al in Tunisia showed that foot examination was recorded only in 5% of patients, ECG was performed in 23.8% of cases and fundoscopy in 19.2% of patients.

Proteinuria was documented in 19.1% of cases and renal function assessed in 54.4% of patients.[24] In a study conducted by Helen D Berlie et al revealed that Arab Americans generally had worse blood pressure control but better lipid control compared to the national sample. This was the first report of the quality of diabetes care in an Arab American population, and demonstrated sub-optimal quality of care according to the ADA clinical practice recommendations [27].

In our study 92% of patients were on anti-platelet therapy as compared to 35.9% in a similar study conducted at tertiary care hospital in America [28].

Quality of life was assessed in 50 patients using SF12 quality of life questionnaire. Scores more than 50 indicates good quality of life. The mean score for Physical Component Score (PCS) and Mental Component Score (MCS) were both below 50(47.8 and 45.3 respectively), indicating a lower quality of life in type 2 diabetes patients. In a study conducted by Grandy et al showed PCS of 39.5 and MCS of 49.1 in type 2 diabetes patients [29]. It can also be assumed that a better quality of care will in turn improve the quality of life in these patients.

In a study conducted in United Arab Emirates demonstrated encouraging progress in the diabetes care reflected by the overall improvement in the mean of HbA1c, LDL and SBP, and the increment in the number of people reaching the target for the indicators for the consecutive years from 2008 to 2010 [30]. Our study results are similar to the results of quality of care assessment studies done in other parts of world. There is a need for further improvement in indicators like foot examination, retinoscopy, and renal function assessment in our hospital, though these indicators are slightly better achieved in our hospital compared to other studies.

CONCLUSION

Our study shows that achievement of glycemic target and LDL target according to ADA criteria was high among our patients. (71% and 66.65 respectively)The target for hypertension was not achieved in majority of the patients. Quality of care was poor for indicators like foot examination and Quality of life scores for both physical and mental health were poor among our patients. Health systems and services must be able to provide essential process and outcomes data to the government agencies responsible for monitoring the health of the population.

Systems with the capacity to share information between specialist and people with diabetes can greatly reduce duplication of services and increase appropriate use of services.

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