Research Article

Assessment of Quality of Life, Drug-drug Interactions and Associated Complications Among Diabetic Patient in a Tertiary Care Hospital

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Abstract

The aim of study is to assess quality of life, drug-drug interaction and associated complication among diabetic patient in tertiary care hospital.

Materials and Methods: A Cross sectional study of six month duration was conducted. Data collected were documented, analysed and entered into Microsoft Excel. Statistical analysis was done by using Microsoft Excel.

Results: 120 patients were included in our study and among them 65 were males and 55 were females. The overall mean score of QoL in diabetic patients was 55.32, indicating a moderate to low QoL in them. From the total drugs prescribed, 143 interactions were found out and among this pharmacodynamic interactions (58.3%) were found to be more than pharmacokinetic interactions (45.8%). Most frequent complication was found to be hypertension (92.5%), followed by retinopathy (41.6%), CAD (39.1%), nephropathy (24.1%), foot ulcer (15.8%), neuropathy (15%) and stroke (9.16%).

Conclusion: Our study highlights the quality of life in Diabetic patient. The occurrence of Type 2 diabetes was more in case of males than female. Smoking is a risk factor for type 2 diabetes. Our study shows that the type 2 diabetes patients have low to moderate QoL. Majority of the patients had hypertension associated as complication.

Keywords: Type 2 Diabetes Mellitus; Quality of Life (QOL); WHOQOL-BREF Questionnaire; Pharmacokinetics; Pharmacodynamics

Abbreviations

BREF: Biomedical Research and Education Facility; CAD: Coronary Artery Disease; DM: Diabetes Mellitus; QOL: Quality of Life; WHOQOL-BREF: World Health Organisation Quality of Life-Biomedical Research and Education Foundation; QoL: Quality of Life; CAD: Coronary Artery Disease; DDI: Drug-Drug Interaction; HTN: Hypertension

Introduction

Diabetes mellitus is a group of metabolic disorders which is characterized by elevated blood sugar level over a long period of time. Currently, India is a country with second highest number of people with type 2 DM. As per IDF data for the year 2013, there were 65.1 million people with diabetes in India, which is predicted to rise up to 109 million by the year 2035. 1 Quality of life is measured as social and physical functioning and perceived physical and mental well-being. People with diabetes have a worse

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quality of life than people with no chronic illness, but have a much better quality of life than people with most other serious chronic diseases. Drug interactions are more common in type 2 diabetes mellitus; hence require clinical attention to rule out severity of reactions. 2 There are mainly 2 complications associated with diabetes, which are microvascular diseases (diabetic nephropathy, diabetic retinopathy and neuropathy) and macrovascular diseases (coronary artery disease, peripheral arterial disease, and stroke).

Methods and Material Used

- **Study site**: The study was conducted at Department of General Medicine in a tertiary care hospital, Kannur Kerala
- **Study design**: Prospective, observational, and questionnaire study
- **Study material**: QOL index was measured using the WHOQOL-BREF questionnaire. The WHOQOL-BREF contains 26 questions related to the physical health, psychological, social, and environmental status of the patient.

Inclusion criteria

- Patients from either sex with an age of 50yrs or older admitted to the hospital for treatment of Diabetes.
- Patients with duration of stay in hospital greater than 24hrs.

Exclusion criteria

- Patient of age less than 50 years
- Patients with type 1 diabetes
- Pregnant /lactating women.

Study procedure

A prospective observational study for assessing the quality of life, drug-drug interactions and associated complication was conducted at the department of general medicine in a tertiary care hospital, Kannur. Detailed information regarding the study was explained to the participants who are hospitalized due to type 2 diabetes. Informed consent was obtained from participant who are willing to participate in the study. A data collection form was designed to collect the patient information. The information based on the patient demography, diagnosis, past medical and family history, social habits, complications, drug allergies, and treatment chart were collected and documented. The quality of life of the patients was assessed using a questionnaire adopted from WHO standard questionnaire (WHOQOL-BREF). The WHOQOL-BREF was translated into the native language, Malayalam. The data was collected and entered in Microsoft Excel. The domain scores were calculated using the WHO-BREF scale.

Scoring of WHOQOL BREF: The raw scores collected from the patients were converted into transformed score. The ones with the higher score have better quality of life.

Ethics and consent

The study was approved by the Institutional Human Ethical Committee of Crescent College of Pharmaceutical Sciences filed under 011/2019/CCOPS/IEC Permission to conduct the study was obtained from the chairperson of the institutional human ethics committee.

Results

A total of 120 patients satisfying the inclusion criteria were included in the study and the duration of the study was 6 months.

Distribution of demographic and clinical characteristics

Out of 120 patients enrolled in the study, 65(54%) were males and 46(46%) were females.

The diabetic patients above the age of 50 years and below 86 were included in the study. Among 120 patients included in the study 27(22.5%) patients belongs to 50-60 years age group, 50(41.63%) belongs to 61-70 years age group, 26(11.6%) belongs to 71-80 age groups and the remaining 17(14.1%) of them belongs to 81-90 year age group.

Variables	N (%)
Age group	
50-60	27
60-70	50
70-80	26
80-90	17
Gender	
Male	65
Female	86

Table 1: Demographic and clinical characteristics of participants (n = 120).

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Quality of life in diabetic patient using WHO-BREF Questionnaire

The assessment of quality of life includes 4 main domains which are physical health domain, psychological health domain, social health domain and environmental health domain. Here in our studies, we got 48.58% in physiological health domain, 43.6% in psychological health domain, 70.7% in social health domain and 58.42% in environmental health domain. The overall quality of life in type 2 diabetic patient was found to be 55.32% (Figure 1).
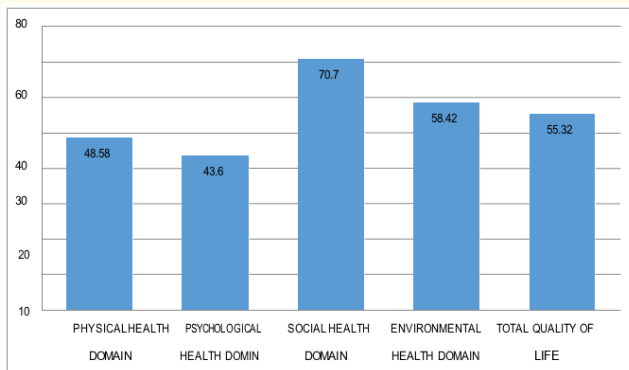

Figure 1: Comparison of transformed score of the WHO Qol-BREF in total and its four Domains.

Drug- drug interaction

From the total drugs used in our study the drug-drug interactions were checked. A total of 140 drug interactions were noted and are classified based on mechanism of action and severity using Medscape Drug Interaction Checker. The use of multiple medications was associated with significantly increased risk of being prescribed with potentially harmful drug-drug interactions.

Drug-drug interactions based on mechanism of action

Based on mechanism of action the drug-drug interactions are classified into pharmacokinetic, pharmacodynamic and interaction by unknown mechanism. In our study, most of the potential drug interactions were pharmacodynamic 70 (58.3%) in nature followed by pharmacokinetic interactions 55(45.8%) (Figure 2).

Drug-drug interactions based on severity

Based on severity of drug-drug interaction the interactions are classified as major, moderate and minor. The majority of the

Figure 2: Distribution of drug-drug interactions based on mechanism of action.

interactions based on severity were categorized as moderate 87(72.5%), followed by major 32(26.6%) and minor 24(20%) (Figure 3).
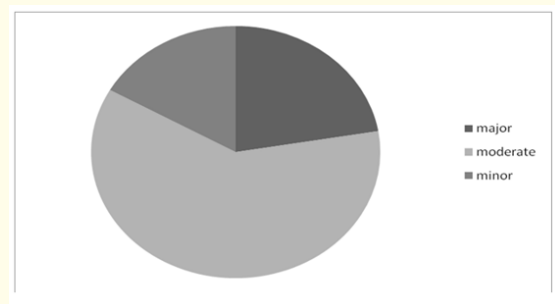

Figure 3: Distribution of drug-drug interactions based on severity.

Distribution of sample according to complications

We assessed the patients for the presence of complication and found that the samples presented hypertension (92.5%), followed by retinopathy (41.6%), CAD (39.1%), nephropathy (24.1%), Foot ulcer (15.8%), neuropathy (15%) and stroke (9.16%).

Figure 4: Distribution of sample according to complications.

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Discussion

In our study population of 120 patients 65 were males and 55 were females. Most people admitted with diabetes were in age group of 61-70 (41.63%) years.

In our study, among the four domains of WHOQoL- BREF, the highest mean score was observed in social health domain (70.7), implying that study population had relatively more satisfaction of their personal relationships and also social support. Moreover, the lowest mean score was observed in Psychological Health Domain (43.6), indicating not very good bodily image, positive feelings, self-esteem, personal beliefs and concentration and also having more negative feelings.

Among the 120 patients involved in our study there was probability for a total of 140 drug-drug interactions. Patients prescribed with greater than 5 drugs were responsible for greater probability for potential DDIs. Therefore, polypharmacy is a major depending factor for development of drug-drug interactions. DDIs in patients receiving multiple drug therapy may lead to increased risk of hospitalization and higher health care cost. In our study, DDIs mainly occur between antihypertensives and antiplatelets. In our study, most of the potential drug-drug interactions were pharmacokinetic 56 (45.8%) in nature followed by pharmacodynamic interactions 71(58.3%).

Based on the severity majority of the interactions are moderate 87(72.5%), followed by major 32 (26.6%) and then minor 24(20%) [1-6]. The interactions have different effects upon patients and it either increases the toxicity of drug or antagonise the effect of other resulting in therapeutic failure. The majority of interactions seen are pharmacodynamic in nature with moderate severity. The utilization study of drugs and monitoring drug-drug interactions in diabetic patients helps in management of disease and improving quality of life.

In our study, out of 120 patients the major complication associated with type 2 diabetic patients was found to be hypertension followed by retinopathy. There are three ways in which high glucose levels in the blood pressure. They are the blood vessels loss their ability to stretch, the fluid in the body increases, especially if diabetes I already affecting the kidneys and insulin resistance may involve processes that increase the risk of hypertension.

There are some limitations in the current study. Most measures were done by the patient itself that may be influenced by fluctuation in the respondent's attention, motivation, comprehension, and response biases such as social desirability, which can potentially cause measurement error.

Conclusion

Out of 120 patients maximum number of patients was in the age group of 50-90. The occurrence of Type 2 diabetes was more in case of males than female. Our study shows that the type 2 diabetes patients have low to moderate QoL. In that the social health domain is the highest and the psychological health domain is the lowest. The pharmacodynamic interactions was found to be more than the pharmacokinetic interactions. Majority of the interactions are moderate followed by major and minor. The consequences due to DDIs may increase the cost and decrease the effectiveness of therapy. DDIs can also increase the incidence of mortality and morbidity. Therefore, careful monitoring of the patients is required. The most seen complication associated with type 2 diabetes mellitus in our study was found to be hypertension, followed by retinopathy. The study conducted to monitor the interactions associated with the drugs and associated complications can help in improving the quality of life of the patients.

Conflict of Interest

Authors declare that no conflict of interests exists.

Summary

A prospective observational study was done to assess the quality of life and associated complications and drug-drug interaction in type 2 diabetic patients. Quality of life was assessed using the WHOQOL-BREF questionnaire.

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