



## MEDICATION KNOWLEDGE AND ITS EFFECT ON BIOCHEMICAL LABORATORY PARAMETERS

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**ABSTRACT** **Background:** Medication knowledge is the range of information that patient have about the medications. One of the important fundamentals in the world of health and medicine is the knowledge and awareness of the illness and its medications. Patients' knowledge about the medications is of vital importance in prevention of drug related adverse effects as well as treatment success. **Aim:** To evaluate the effect of medication knowledge on biochemical parameters in patients with type 2 diabetes mellitus. **Methods:** A prospective observational study was conducted amongst the diabetic patients of Borij village, Gandhinagar district, Gujarat. Total of 24 patients were screened and enrolled in the study. The medication knowledge questionnaire (MKQ) was used to assess the patient's medication knowledge. Patients enrolled in the study were screened for various biochemical parameters such as fasting blood sugar (FBS), postprandial blood sugar (PPBS), and glycated hemoglobin (HbA1c). **Result:** 24 patients participated in the study and 21 completed the study successfully, with average age of 56 (SD=7.225) years. The mean medication knowledge was 14.09 at baseline and increased to 22.6 at final follow up. Glycemic test especially FBS, PPBS, and HbA1c were improved significantly from 162.8 mg/dl to 140.1 mg/dl, 221.6 mg/dl to 146.5 mg/dl and 7.3 % to 6.5 % respectively. **Conclusion:** Positive and significant association has been observed between medication knowledge and improved biochemical parameters.

**KEYWORDS :** Medication knowledge, counseling, FBS, PPBS, HbA1C.

### INTRODUCTION

“Diabetes mellitus (DM) is metabolic-vascular syndrome of multiple etiologies, characterized by chronic hyperglycemia with disturbance of carbohydrate, fat and protein metabolism resulting from defect in insulin secretion, insulin action or both. This disorder is frequently associated with long term organ damage which can lead to failure of vital organs such as eyes, kidneys, nerves, heart and blood vessels” (icmr.nic.in., 2016).

The prevalence of diabetes and its long term complications are rapidly rising all over the globe at an alarming rate. The major reason behind the large numbers of cases is lack of medication knowledge and therefore self-medication withdrawal. Therefore, medication knowledge could play an important role in management of diabetes and its long term complications. Medication knowledge is defined as “range of information that patients possess or own about the medications”. It includes information about the name of the drug, indication, dose, dosage regimen, adverse effects, and precautions to be taken during treatment period, contraindications, drug-food or drug-drug interaction and medicine storage conditions. Therefore, it is necessary for individual to have medication knowledge and for that patient education, training and counseling must require to adhere the prescribed medications. Patient education and counseling is defined as “a combination of teaching activities that focus on keeping patients informed about their health condition treatment plans, medication therapy and self-care management to facilitate changes in behavior for improvement and maintenance of health. Patient education aims to provide clinical information to patients with the goal of increasing understanding and encouraging health promoting behavior. Patient education is the most important variable affecting treatment compliance (Gangwar., 2013).

Knowledge and awareness about the disease can have positive influence on attitude and practices of patients that could lead to better management of diabetes and eventually good quality of life. A patient when involved in self management of disease through guidance, education and awareness programs becomes more compliant toward life style changes and drug therapy which help both the practitioner and patient to achieve the treatment goals. However, lack of knowledge and attitude along with practice gap exists in type 2 diabetes mellitus management that does not allow patients and healthcare professionals to implement life style changes which could affect the rate of morbidity and mortality associated with diabetes (Zeyana., 2015).

Side effects with every patient define the patient medication knowledge as awareness of the drug name, purpose, administration

schedule and side effect (Thami., 2015). The role of community pharmacists in educating patients is very important as a large percentage of the patients go directly to the pharmacy stores to obtain their medications. Therefore, the active role of pharmacists would be more effective and beneficial in educating patients about medications (Thami., 2015). Patient's knowledge of medication is not only of vital importance in the prevention of drug related problem, but a major factor that influence treatment adherence and subsequently successful improvement in the disease conditions and hence if provided, it offers an opportunity for one to attain a full health potential (Mufaweli., 2014). Bases on the current piece of evidence for benefit of patients, we made an attempt to evaluate the effect of medication knowledge on biochemical parameters in patients with diabetes mellitus.

### Methodology

A prospective observational study was conducted amongst the diabetic patients of Borij Village, Gandhinagar district, Gujarat, India. There were total 62 known cases of DM and all were invited to participate in our proposed study. Out of 62, total 24 patients have been enrolled in the study of which 21 subjects have successfully completed the study.

The patients enrolled in the study were assessed for medication knowledge using the medication knowledge questionnaire (MKQ), prepared in-house by our expert team members. The designed questionnaire consists of 8 questions, pertaining to – name, color, shape, dose of the medicine and storage conditions as well as side effects and precautions. If the patient answers the question fully without prompting then they were given 4 points. If the patient answers the question fully with prompting they were given 3 points. If the patient answers the question partially without prompting they were given 2 points. If the patient answers the question partially with prompting they were given 1 single point. If they give no answer they were given 0 point. Rated score was summed up to obtain final score. The maximum score for this scale is 32 points.

In this study, the patient were screened for height, weight, body mass index and biochemical laboratory parameters like Fasting blood sugar (FBS), Postprandial Blood Sugar (PPBS), Glycated Hemoglobin (HbA1C). The biochemical parameters were screened by a Glucometer instrument (True Result Company) and help of a laboratory technician. The patients included in this study were also taught to use the glucometer instrument.

### Statistical Analysis:

The data were collected and analyzed using Microsoft Excel 2007

and graph pad prism. Comparisons were made between initial and final data using appropriate statistical analysis like mean  $\pm$  standard deviation (SD), mean, standard deviation, correlation coefficient, inferential T-test, to test the level of significance.

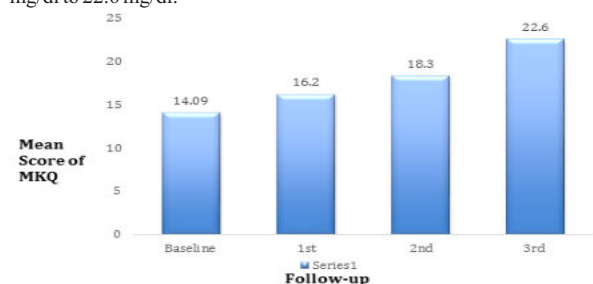
## RESULT

### Demographic details

Fourteen males and seven females took part in the study. The mean age of the patient was 56 (SD=7.225) years while age range was 40-69 years. A range of BMI was 18-26 kg/m<sup>2</sup>. Most of the patients were educated up to primary education while higher education was less. Sample participants were mostly distributed in all category of employment. Most of participants were with Diabetes history of 1-5 years and 5-10 years. The most common occurring complications were Hypertension, Asthma, COPD and Hyperlipidemia.

### Medication knowledge

About more than half of the patients were not aware of dose, duration, side effects and remained constant. Significant association was seen between counseling and medication knowledge precautions of their anti diabetic medications. The mean score of respondents for all the questions from medication knowledge questionnaire was increased. Increase in the mean medication knowledge score was seen from 14.09 mg/dl to 22.6 mg/dl.



**Graph 1: Mean Score of Medication Knowledge Questionnaire V/S. follow-up.**

### Association and correlation

To test the effect of medication knowledge and its association, it was decided to perform correlation between variables. Correlation of various biochemical tests with MKQ was performed.

**Table 1: Correlation between FBS, PPBS, HbA1c and MKQ.**

Parameters	Baseline	1st Follow-up	2nd Follow-up	3rd Follow-up
PPBS with MKQ	R= -0.375 P=0.0855	R= -0.139 P=0.5373	R= -0.206 P=0.3577	R=0.142 P=0.5285
FBS with MKQ	R= -0.31 P=0.1603	R= -0.018 P=0.9366	R= -0.03 P=0.8946	R= 0.37 P=0.0901
HbA1C with MKQ	R= -0.349 P=0.1349	----- -----	----- -----	R= 0.37 P=0.0901

## DISCUSSION

Medication therapy in the treatment of diabetes mellitus depends on several factors such as individual life style characteristics, values of glycated hemoglobin, fasting and postprandial glycaemia, presence of obesity, age, socio-economic level, diabetes related complications, co-morbidities and mechanisms of anti-diabetic drug action. Lack of knowledge of the medication has a strong impact in health and quality of life of people especially those with one or more chronic health conditions.

Gangwar and co-authors (2013) have undertaken a pilot study because, in Indian community pharmacies especially at the study site, patient do not attain counseling on their medications because physicians are too busy or most of them are traditional practitioner and most of the pharmacy store are without pharmacist at the study site. In the present study, our findings showed that the knowledge of medication was very poor in the rural population. We selected the village Borij to assess the awareness regarding medication knowledge. Assessment of medication knowledge in the diabetic patient of Borij village was using medication knowledge questionnaire (MKQ) and significant increase in the knowledge level has been observed throughout the study. Moreover, a significant association between the counseling of diabetic patients and their anti-diabetic medication knowledge has been observed during entire study period.

Screening is a procedure for evaluation or investigation of the undiagnosed patient or the patient are at high risk of getting the disease. Screening in population may depend upon the setting or the place where it is performed. Diabetes mellitus parameters include FBS, PPBS, HbA1C, Height, Weight, BMI, Age, Hip Circumference, Waist circumference, Age.

Early detection of disease through screening will affect several factors like reduction in the severity and frequency of the effects of diabetes or prevention or delay of long-term complications. Pharmacist indulges in screening processes are highly recommended by organizations but in developing countries it is not yet been in existing.

The effectiveness of screening may also depend on the setting in which it is performed. In general, community screening outside a health care setting may be less effective because of the failure of people with a positive screening test to seek and obtain appropriate follow-up testing and care or, conversely, to ensure appropriate repeat testing for individuals who screen negative.

Although there is ample scientific evidence showing that certain risk factors predispose individuals to development of diabetes, there is insufficient evidence to conclude that community screening is a cost-effective approach to reduce the morbidity and mortality associated with diabetes in presumably healthy individuals. While community screening programs may provide a means to enhance public awareness of the seriousness of diabetes and its complications, other less costly approaches may be more appropriate, particularly because the potential risks are poorly defined (American diabetes association. Diabetes Care., 2002).

Pharmacist plays an important role in screening as it helps patient in earlier identification and treatment of diseases to monitor and control maintain normal. Limited screening uptake increase mortality among non-attendees invited to screening and inadequate length of follow-up can lead to complication and worsening of the disease state (Sheehy., 2010). The prevalence of diabetes mellitus is rising and needs adequate knowledge for its control (Balla., 2014). There is also evidence to show that increasing knowledge regarding diabetes and its complications has significant benefits including increase in the compliance to treatment, thereby decreasing complications of diabetes (Deepa., 2014)

Unless individuals with diabetes know that the disease can be transmitted to the offspring, steps cannot be taken to prevent diabetes in the high-risk group in the next generation. Several studies have reported the positive impact of counseling by clinical pharmacists on glycemic control and quality of life outcomes in the diabetic population (Adepu., 2007).

In this study, patient enrolled were screened with the help for various parameter like HbA1C, FBS and PPBS. Decrease in the patients glycemic levels were seen at the end of the study compared to baseline. Association of education with various parameters is well recognized and established in literature. Our study in this setting also proves the association of the education and its association with variable thought the degree of association was weak.

## CONCLUSION

Results of the present study reveals that majority of the patients with DM presented a very low level of medication knowledge. The lack of knowledge may worsen the health state of the patients with DM, and eventually increase the cost of illness. The results obtained in the study showed that counseling about anti-diabetic medications increased the knowledge levels of diabetic patients. Improvement in association between knowledge and screening were observed.

**Conflicts of interest:** No conflict of interest

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