International Journal of Research in Pharmacy and Pharmaceutical Sciences
ISSN: 2455-698X; Impact Factor: RJIF 5.22
Received: 22-07-2020; Accepted: 07-08-2020; Published: 23-08-2020
www.pharmacyjournal.in
Volume 5; Issue 4; 2020; Page No. 61-64

Assessment and awareness of insulin usage in diabetic patients

Shanmugam S[1], Anju Antony[2], Christin Raj[3*], Steffi Sabu[4], Theertha Vijayasree[5], Simin Sabu Jacob[6]
[1-6] Department of Pharmacy Practice KMCH College of Pharmacy, Kalapatti Road, Kovai Estate, Coimbatore, Tamil Nadu, India

Abstract
The incidence of diabetes has been increasing at a startling rate in India, moreover one in six people with diabetes in the world. The purpose of this study was to assess the knowledge, attitudes and practices (KAP) of patients regarding diabetic and effective management of disease prognosis.
A Prospective observational study was conducted in Kovai Medical Center and Hospital, a multispecialty hospital in 2016. Outpatients were provided with a validated KAP questionnaire encompassing closed-ended queries. The responses were scored and analyzed to develop an appropriate counseling program. Pharmacist counseling sessions were carried out in the regional language for 10- 15 minutes.
A total of 200 patients were screened, 120 patients fulfilled the inclusion criteria. The socio-demographic shows the incidence of diabetes was more prevalent among males 62.5% and 60% of the population were within the age group of 51- 70 years. Educational background and the duration of insulin usage cannot be consistently linked to high health literacy. KAP scores improved significantly ($p < 0.05$) after counseling as compared to the first visit. 23.3% of subjects had occasional hypoglycemic and was significantly reduced to 5 %. At the final visit the drop in mean FBS (mg/dL), RBS (mg/dL) and HbA1C levels from 177.30 to 138.91, 249.85 to 177.66 and 9.47 to 7.88 respectively ($p< 0.05$).
The study advocates that the pharmacist intervention has improved the perception of disease, insulin usage, and lifestyle changes that facilitated to achieve the best possible level of glycemic control and quality of life.

Keywords: diabetes, insulin, knowledge attitude and practice (KAP), medication therapy management (mtm), pharmacist counseling. pharmacist intervention

1. Introduction

India is hastily emerging as the diabetes capital of the world. Diabetes mellitus (DM) type 2 is the most prevalent worldwide, accounting for 90-95% of all cases of diabetes which are mostly diagnosed after 40 years of age. A large proportion of type 2 diabetics eventually require insulin for blood sugar control. The assessment of knowledge and attitude towards insulin and oral diabetic medications was considered important to address the gaps identified [1]. Compliance with drug treatment can also be directly affected by the individual's health beliefs, social and medical concerns, and denial of their illness. Knowledge remains an important prerequisite to good compliance with medical therapy. Attitudes and beliefs towards medications have also been found to be highly correlated to medication acceptance and adherence [2].

The involvement of pharmacists and other stakeholders in relevant clinical cognitive activities including encouraging patients to self-manage their disease had been advocated [3]. The ability to self-care in the form of adherence to diet and drugs, blood glucose monitoring, foot care, exercise; recognition of warning sign is crucial elements in secondary prevention and management of DM [4]. Pharmacists were trained and experienced with the unique skills in medication therapy management (MTM) and were able to improve healthcare outcomes by addressing the medication-taking behavior of patients [5].

KAP associated with diabetes could be helpful for primary case detection, prevention, and curtail the consequences. KAP studies reveal that the very poor or low level of knowledge, attitude and practice among diabetes patients. Effective management of disease, control of risk factors, diagnosis, and prevention awareness is associated with knowledge, attitude and practice of diabetic patients [6].

Barriers to insulin usage in a qualitative study of people with diabetes were fear about illness, shame, guilt or self-blame, ideas or beliefs about causation of diabetes, personal or cultural belief, and effort finding mutual ground with clinicians on diabetes management [7]. Conventional barriers to insulin commencement were fear of hypoglycemia, duration of therapy, needles, and pain. It is fascinating to learn that these barriers still prevail even after initiating the use of insulin among patients. Knowledge of HbA1c and the target goal line had a positive result on maintaining optimum glycemic control in people with DM. Furthermore, lack of time to instruct patients on monitoring the glycemic levels and adjustments in insulin dose has also been found to be a common challenge faced by general practitioners [8].

This study aims at the assessment of baseline planes in the area of knowledge, attitude, and practices among diabetic patients. These results were used to develop a counseling program to intervene in diabetes awareness and practices. Patient counseling advances the patient's capability to cope with their disease and make informed decisions concerning medication and its management. It also helps motivate patients to change any detrimental dietary and lifestyle habits.

The proposition to accomplish the finest probable level of clinical outcome involved in the utilization of appropriate therapy, comprehensive medication review (CMR), education on adherence, and optimization of therapy had reported a prompt advance in self-management of disease

and better glycemic control was highly advantageous [9].

2. Materials and Methods

A Prospective observational study was conducted in Kovai Medical Center and Hospital (KMCH), a multispecialty hospital located in Avinashi road, Coimbatore, Tamil Nadu. The study was carried over 6 months from April to September 2016.

2.1. Study Population

200 Diabetic patients who received insulin treatment under the endocrinology department during the period April 2016 to August 2016 were screened from which 120 patients fulfilled the inclusion and exclusion criteria which were then enrolled for the study.

2.2. Study Criteria

- Inclusion criteria
- Diabetes patients who are taking insulin.
- Patients who are willing to participate in the study.
- Exclusion criteria
- Patients who are only taking oral hypoglycaemic drugs.
- Pregnant women.

2.3. Sources of Data

A data collection form was designed to collect patient's information including demographic data (age, sex, inpatient number, weight, height) and medical data (family and social history, type and duration of diabetes, medications, hypoglycemic events, and storage) attached with the KAP questionnaire. The patient information leaflet was designed to provide patient education.

2.4. Study protocol

The institutional research and ethics committee approved the study and issued a letter of permission to conduct the study. A suitably designed and validated KAP questionnaire was administered at baseline and the final follow up to all the study patients to assess the awareness regarding the insulin usage. The questionnaire covered three areas: Knowledge, Attitude, and Practice. A total of 29 questions, with 10 questions related to Knowledge about diabetes and insulin, 5 questions to assess the Attitude of the patients, 14 questions regarding Practices. This questionnaire was filled in at a face-to-face interview. For scoring, 1 point was awarded for each correct answer and none for an incorrect or unsure answer, thus, the maximum possible score was 29.

At enrolment, patient's demographic details, past and present medical and medication history, family history, laboratory test values like fasting blood glucose, postprandial blood glucose, glycated hemoglobin (HbA1C) were recorded. During follow-up over 3 months, the changes in the KAP score, HbA1C, FBS, and RBS were investigated.

The KAP questionnaire responses were analyzed and used to help develop an appropriate counseling program. Pharmacist counseling sessions in the regional language were carried out for 10- 15 minutes. After the first counseling session, the patients were provided printed leaflets in the local language containing information on insulin.

2.5. Statistical Analysis: IBM SPSS Statistics software version 20 was used for the statistical analysis. We presented the descriptive data for the continuous variable as Mean ± SD and the categorical variables as percentage %. We assessed the patient's knowledge, attitude, and practice towards insulin usage and diabetes by a validated KAP questionnaire. The student t-test was performed to compare the improvement of disease status and the KAP score of the individual patients. A value for $p < 0.05$ was considered statistically significant.

3. Results and Discussion

During the study period Out of 200 patients were screened, 120 patients fulfilled the inclusion criteria, which were then enrolled and followed up through the study. The socio-demographic distribution reveals that the incidence of diabetes was more prevalent among male patients 75(62.5%) and 45(37.5%) in females. The demographic profile of the study participants shows increased incidents among the male population in South India [10]. The majority of the patient among the study population was within the age group of 51-70 years (60%), 31- 50 (22.5%) followed by 71-90 (11.6%), and then 10-30 (7.8%). Embracing sedentary behavior, and unhealthy food habits, aided by growing urbanization, the diabetes pandemic lingers to soar globally. These hostile factors adjunct with the already heightened genetic predisposition for diabetes among Indians, consequently lead to the onset of diabetes at a younger age [11].

Among the insulin users, 115(95.8%) subjects had Type 2 diabetes. 42(35%) subjects had no family history of DM which shows the rapid emergence of DM, this probably indicates the rapid development of diabetes among the general population [12]. Amid the general population. 58(48.3%) of the subjects had diabetes for more than 10 years. Also, 47(40%) patients in the study started using insulin from a period of 1-5 years. 23.3% of subjects had an occasional hypoglycemic attack and was shown a reduction to 5 % after comprehensive diabetic education [13].

We observed that in the study population majority of the patients were prescribed with Human Mixtard i.e. 64(55%) followed by Human Actrapid 11(9.16%) [Figure 1].

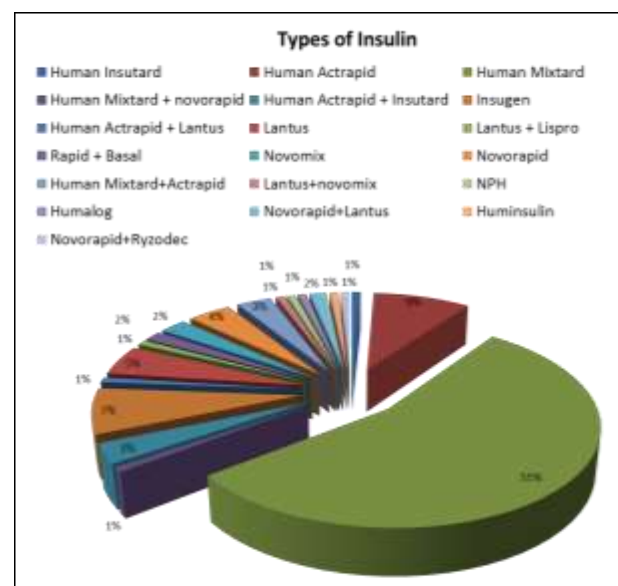

Fig 1: Types of Insulin

About 83(69%) subjects used insulin syringe and vial for administering insulin, while others used other devices such as prefilled pen 15% and cartridge 15.8%. Most of the

surveyed patients about 94% store insulin properly. The economic aspects and availability of pharmaceuticals play a pivotal role in the choice of therapeutic options to our patients [14].

KAP varied significantly among the level of education, a higher mean score (19.1) was observed in patients who had college level of education with a better understanding of the benefit of insulin use awareness that insulin is not habit-forming, need for continuity, and the confidence for self-administration of insulin [Table 1]. Subjects who were less educated had a 40% added mortality compared with a higher level of education [15].

Table 1: Comparison of education level and KAP score

Education	Total Score	K Score	A Score	P Score
Literate 23(19.1 %)	18.6	6	2.7	9
Illiterate 13(10.8%)	16	5.6	2.5	7.8
Elementary 26(21.6%)	18.6	6.9	2.7	8.9
Secondary 21(17.5%)	18.6	6.5	3	9
College 37(30.8%)	19.1	6.7	2.7	9.6

Longer duration of insulin use (i.e. 10-20 with a mean score of 19.6 and, >20 years with a mean score of 18.5) was associated with awareness of continuing insulin use and that insulin is not habit-forming [Table 2].

Table 2: Comparison of duration of insulin use and KAP score

Duration (year)	Total score	K score	A score	P score
< 1	17.9	6.4	2.7	8.7
1 – 5	18.3	6.5	2.8	8.9
6 – 10	18.2	6	2.6	9.4
11 – 20	19.6	6.7	2.8	10
>20	18.5	7	4	7.5

The diabetes awareness level and the effect of pharmacist counseling were studied using the KAP questionnaire. On analyzing the responses, the percentage of patients in the study population who answered correctly were more at the final follow-up compared to the baseline. On evaluating the knowledge part of the questionnaire, we found that patients were not aware of the different types of insulin 60.8% and different types of delivery devices 5.8%. Among our respondents, only 18.3% knew that diabetes is a hereditary disorder. 74.5% of subjects thought that once insulin is started diet and exercise become less important.

In the attitude part of the questionnaire, only 57.5% of patients were confident about self-administering insulin and 58.3% of patients thought that insulin is better than tablet [Table 3].

Table 3: Assessment of Attitude towards diabetes and insulin

Attitude	First Visit (%)	Second Visit (%)
Negative	56.6	43.3
Positive	36.2	65.7

Even though the overall KAP scores of the study group were significantly ($p < 0.05$) higher at the end of the study [Figure 2], the practice domain did not show significant improvement, since the scores at the first visit itself were high. This also recommends the necessity of frequent follow-up counseling sessions and patient interactions.

Although HbA1C is the internationally accepted test, diabetologists generally advise their patients to go for FBS and RBS as the tool for monitoring glycaemic control. The mean FBS, RBS, and HbA1C levels of patients during the first visit and final visit were recorded. The percentage reduction in FBS, RBS and HbA1C levels reduced significantly from 177.30 mg/dL to 138.91 mg/dL, 249.85 mg/dL to 177.66 mg/dL and 9.47% to 7.88% respectively ($p< 0.05$) in the second visit as a result of pharmacist counselling. The American Diabetic Association has advised that education on self-management is indispensable to the patient with diabetes with the knowledge and skill that is needed to perform self-care, manage the crisis, and make lifestyle changes [16]. Our study shows that pharmacist counseling may help patients to control blood sugar levels. A significant reduction in the FBS, RBS, and HbA1C levels of the patients was observed ($p < 0.05$) in the final visit. Utilizing the principles of Medication Therapy Management Programs and Patient-Centered Diabetes education adds value to diabetes management and the specific interventions aimed at improving patient knowledge can improve clinical outcomes, cost savings, patient satisfaction [17, 18].

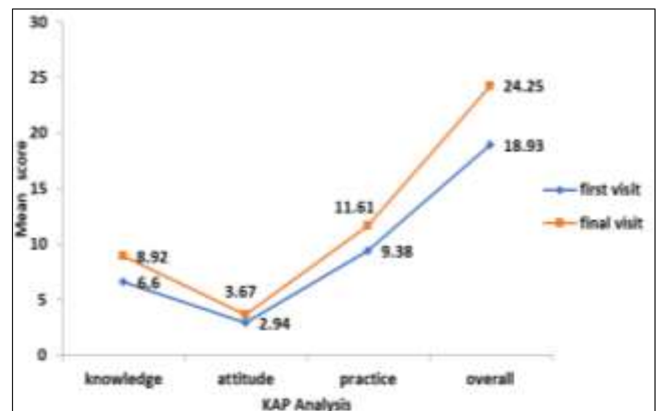

Fig 2: Comparison of Mean scores before and after counseling

4. Conclusion

Pharmacists' involvement in patient care has resulted in a reduced number of hospital admissions and emergency department visits, as well as the improved health status of patients. This evident from our study results, the KAP score of the study group patients improved significantly ($p < 0.05$) after pharmacist counseling as compared to the first visit.

An encouraging part of this study is that many subjects were willing to wait patiently and listen to the counseling session. This reflects the thirst for information among diabetic patients and also the lack of such programs in India. A few patients were not quite comfortable with the pharmacist talking to them about medications. These patients need to be convinced about the importance of this service and this can be done by establishing a trusting and professional relationship with them, which should motivate them to participate in such counseling programs.

This study has highlighted the need for launching more interventional and educational programs with the help of local physicians, health care workers, community leaders and mass media with the wealth of talented and skilled pharmacists

5. References

1. Choudhury SD, Das SK, Hazra A. Survey of knowledge-attitude-practice concerning insulin use in adult diabetic patients in eastern India. Indian J Pharmacol. 2014; 46:425-9.
2. Gul, Naheed. Knowledge, attitudes and practices of type 2 diabetic patients. JAMC, 2010; 22:128-31.
3. Anju Gautam, Dharma Nand Bhatta, Umesh Raj Aryal. Diabetes related health knowledge, attitude and practice among diabetic patients in Nepal. BMC Endocr Disord, 2015; 15:25.
4. Wah Yun Low, Wen Ting Tong, Colin Binns. Migrant Workers in Asia Pacific and Their Rights to Health Asia Pac J Public Health. 2015; 27(6):584-7.
5. Uche Anadu Ndefo, Aisha Morris Moultry, Portia N. Davis and Raven Askew, Provision of Medication Therapy Management by Pharmacists to Patients with Type-2 Diabetes Mellitus in a Federally Qualified Health Center. P T. 2017; 42(10):632-637.
6. Fatma Al-Maskari, Mohamed El-Sadig, Juma M Al-Kaabi, Bachar Afandi, Nicolas Nagelkerke, Karin B, et al. Yeatts. Knowledge, Attitude and Practice of Diabetic patients in the United Arab Emirates. Plos One. 2013; 8(1):e52857.
7. Andres Pichon-Riviere, Vilma Irazola, Andrea Beratarrechea, Andrea Alcaraz, and Carolina Carrara. Quality of life in type 2 diabetes mellitus patients requiring insulin treatment in Buenos Aires, Argentina: a cross-sectional study. Int J Health Policy Manag. 2015; 4(7):475-480.
8. Tong WT, Vethakkan SR, Ng CJ. Why do some people with type 2 diabetes who are using insulin have poor glycaemic control? A qualitative study. BMJ, 2015; 5:e006407
9. Jennifer A Flavin, Christopher G Green, Stephanie C Cook, Stuart J Beatty. Impact of a pharmacist-provided comprehensive medication review service for urgent care patients. Jucm, 2015.
10. Mark Corriere, Nira Rooparinesingh, Rita Rastogi Kalyani. Epidemiology of Diabetes and Diabetes Complications in the Elderly: An Emerging Public Health Burden. Curr Diab Rep. 2013; 13(6):10.1007/s11892-013-0425-5.
11. Emma Wilmot, Iskandar Idris. Early onset type 2 diabetes: risk factors, clinical impact and management. Ther Adv Chronic Dis. 2014; 5(6):234-244.
12. Malathy R, Narmadha MP, Ramesh S, Jose M Alvin, and Babu N Dinesh. Effect of a diabetes counseling programme on knowledge, attitude and practice among diabetic patients in Erode district of South India. J Young Pharm. 2011; 3(1):65-72.
13. Stuart T Haines, Joshua J. Neumiller. Understanding insulin management: Role of the pharmacist. American Pharmacists Association. CPE. 2014; 20(3):P85-95.
14. Azar Tol, Gholamreza Sharifirad, Davoud Shojaezadeh, Elahe Tavasoli, and Leila Azadbakht. Socio-economic factors and diabetes consequences among patients with type 2 diabetes. J Educ Health Promot, 2013; 2:12.
15. Nilsson PM, Johnsson SE, Sandquist J. Low educational status is a risk factor for mortality among diabetic people. Diabetic Med, 1998; 15:213-9.
16. Margaret A. Powers, Joan Bardsley, Marjorie Cypress, Paulina Duker, Martha M. Funnell, Amy Hess Fischl. Diabetes Self-management Education and Support in Type 2 Diabetes: A Joint Position Statement of the American Diabetes Association, the American Association of Diabetes Educators, and the Academy of Nutrition and Dietetics. Diabetes Care. 2015; 38(7):1372-1382.
17. https://www.cms.gov/Medicare/Prescription-Drug-Coverage/PrescriptionDrugCovContra/MTM
18. Cranor CW, Bunting BA, Christensen DB. The Asheville project: long-term clinical and economic outcomes of a community pharmacy diabetes care program. J Am. Pharm. 2003; 43(2):1731-1784.