The level of knowledge and attitude on insulin therapy in patients with diabetes mellitus in a teaching hospital of Southern India

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ABSTRACT

Aim of the Study: To assess the level of knowledge and attitude on insulin therapy in patients with diabetes mellitus in a teaching hospital. **Objectives:** 1. To assess the level of knowledge and attitude on insulin therapy among patients with diabetes mellitus. 2. To find out the association between the knowledge and attitude on insulin therapy with the selected study variables. **Materials and Methods:** This is a nonexperimental, cross-sectional study. A total of 100 participants were recruited from the outpatients and inpatients attending the department of general medicine and general surgery. Adult male and female with diabetes mellitus receiving insulin injection and willing to participate in the study were included in the study. The data was collected using 20 structured questionnaires to assess the level of knowledge and modified 4 point Likert scale was used, which contains 10 statements to assess the level of attitude on insulin therapy by interview method. **Results:** It was observed from the results that the level of knowledge among the study participants was as follows: 4% of them had adequate knowledge, 44% had moderately adequate knowledge, and more than half (52%) of them had inadequate knowledge. The level of attitude among the study participants (27%) with diabetes mellitus had favorable attitude, more than half (69%) had moderately favorable attitude, and 4% had unfavorable attitude on insulin therapy. It is observed that there is no statistically significant correlation (r) =0.038, P = 0.707 between the level of knowledge and attitude on insulin therapy among patients with diabetes mellitus. **Conclusion:** This study showed that there was inadequate knowledge and unfavorable attitude among the diabetic patients regarding insulin therapy. The people with diabetes should receive ongoing need-based quality diabetic education by using innovative methods that is tailored to their needs, delivered by skilled healthcare providers.

Keywords: Attitude, insulin therapy and diabetes mellitus, knowledge

Introduction

Diabetes is a group of metabolic diseases, characterized by hyperglycemia resulting from a relative or absolute insulin deficiency. World Health Organization (WHO) has estimated 366 million people will be affected by diabetes mellitus in the world by 2030.[1] More than 3 million patients die annually with underlying diabetes mellitus. In some urban Indian societies, one out of five adults has diabetes.[2] Knowledge about diabetes mellitus is a prerequisite for individuals and communities for its prevention and control. The role of insulin is the key factor in long standing diabetes with drug failure, diabetic micro, macrovascular complications, and beta cell failure. Though there are different kinds of short, intermediate, long acting insulins using syringe, pens are available, the proper technique of administration and methods are important for its effectiveness. We wish to analyze the knowledge and attitude on insulin administration among diabetic patients.

Materials and Methods

This is a nonexperimental, cross-sectional study. A total of 100 participants were recruited from the outpatients and inpatients attending the department of general medicine and general surgery.

The study was approved by the institutional ethics committee. Informed written consent to participate in the study was obtained from the study participants.

Both male and female adult patients with diabetes mellitus receiving insulin injection for more than 6 months duration and willing to participate in the study were included in the study. Participants who were not physically or mentally able to respond to the interview were excluded.

The sample size of the study was 100. It was estimated with 10% precision, 95% of confidence level, and 55.6% anticipated proportion.

The data was collected using 20 structured questionnaires to assess the level of knowledge and modified 4 point Likert scale was used, which contains 10 statements to assess the level of attitude on insulin therapy by interview method.

Knowledge

Knowledge refers to the correct responses given by the patients with diabetes mellitus on insulin therapy like the site of insulin injection, storage of insulin, rotation of the site, mixing of insulin, transportation of insulin, disposal of insulin syringe/pen needle, symptoms of hypoglycemia, which are assessed by using structured interview guide.

Attitude

Attitude refers to feeling expressed by the study participant about insulin therapy like the perception of pain during insulin, neglected self-care, inappropriate insulin administration technique, injections effectiveness, continuing insulin therapy after the control of blood sugar, which are assessed by using 4 point Likert scale.

Insulin therapy

It refers to self-administration of insulin like rapid acting/short acting/intermediate acting/long acting/combination through subcutaneous route by using insulin syringe or insulin pen device by the patient with diabetes mellitus or by their care givers.

Results

It shows that nearly half of the study participants (43%) were in the age group of 51--60 years, majority (75%) of them were males, 64% of them had finished their school education. 97% of them had Type 2 DM, around 36% of them had DM for 6--10 years, 86% of them were on insulin therapy for ≤5 years.

Majority (88%) of the study participants were using syringe for delivering insulin and 90% of them administer insulin by themselves [Table 1].

With regard to the level of knowledge among the study participants, only 4% of them had adequate knowledge, 44% had moderately adequate knowledge, and more than half (52%) of them had inadequate knowledge regarding insulin therapy [Figure 1].

In the level of attitude among the study participants, only 27% of the patients with diabetes mellitus had favorable attitude, more

Table 1: Frequency distribution of patients with diabetes mellitus according to the study variables (*n*=100)

| Study variable	Frequency	Percentage
Age		
31-40	5	5
41-50	21	21
51-60	43	43
61-70	31	31
Gender		
Male	75	75
Female	25	25
Educational Level		
Illiterate	26	26
School	64	64
Degree	10	10
Type of DM		
Type 2 DM	97	97
Type 1 DM	3	3
Duration of DM		
1-5 years	29	29
6-10 years	36	36
>10 years	35	35
Duration of Insulin		
≤5 years	86	86
>5 years	14	14
Type of Insulin delivery device		
Syringe	88	88
Pen type	12	12
Administration of insulin		
Self	90	90
Others	10	10
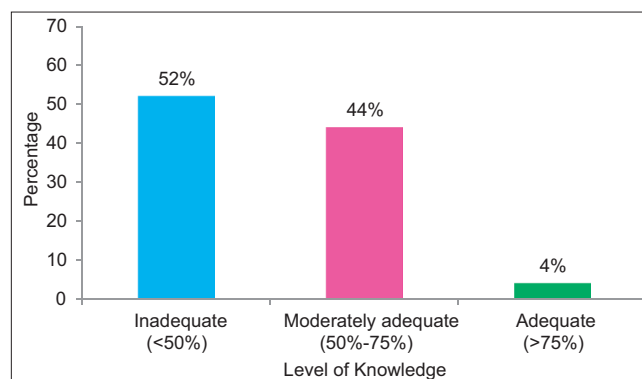
Figure 1: Level of knowledge regarding insulin therapy among patients with diabetes mellitus

than half (69%) had moderately favorable attitude and 4% had unfavorable attitude on insulin therapy [Figure 2].

It shows that there was no statistically significant correlation (r) =0.038, P = 0.707 between the level of knowledge and level of attitude on insulin therapy among patients with diabetes mellitus [Table 2].

It was observed that only age of the diabetics is associated with the level of knowledge on insulin therapy. And there was no statistically significant association observed between knowledge with gender, educational status, type of DM, duration of DM, duration of insulin therapy, type of insulin delivery device, and administration of insulin.

With regard to the association between attitude and demographic variables, there was no statistically significant association observed between with age, gender, educational status, type of DM, duration of DM, duration of insulin therapy, type of insulin delivery device, and administration of insulin.

Discussion

Diabetes mellitus is a major emerging public health problem in India, which can lead to microvascular complications such as retinopathy, nephropathy, neuropathy, and macrovascular complications such as stroke, heart disease, and peripheral vascular disease if left untreated. The treatment of diabetes mellitus includes administration of oral hypoglycemic agents and injectable insulin therapy along with life style modifications such
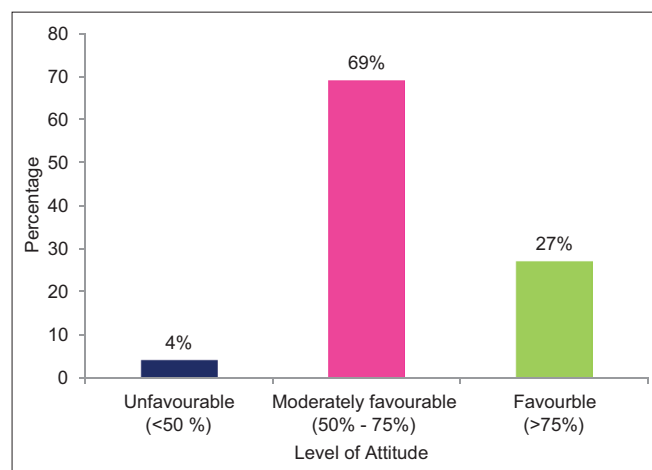

Figure 2: Level of attitude on insulin therapy among patients with diabetes mellitus

Table 2: Correlation between the level of knowledge and attitude on insulin therapy among patients with diabetes mellitus (*n*=100)

Variables	Mean	Pearson correlation	*P*
Level of Knowledge	9.2	0.038	0.707, NS
Level of Attitude	27.7		

NS – Not Significant

as diet and exercise. Insulin is the main stay of therapy, when oral hypoglycemic drug fails or when there is diabetic micro and macrovascular complication occurs.[2]

Different reasons are explained in failure to achieve therapeutic goals such as poor adherence to treatment regimens by the patients. Despite the therapeutic effects and benefits of insulin, many patients are reported to be reluctant to initiate such therapy for reasons pain and inconvenience to the social embarrassment of using syringes in public.[3]

Insulin therapy requires understanding and coordination of both the person with diabetes mellitus and those responsible for providing diabetic care. There is no definite insulin dose that works well for every individual, the dosage of insulin changes based on blood glucose levels and the type of insulin used. Therefore, insulin treatment must be individualized to fit the life style of the individual and underlying diabetic complications.[2]

To overcome the barriers of insulin therapy, the diabetic patients on insulin therapy need to be knowledgeable concerning the disease and insulin therapy and also they must develop a positive attitude toward self-administration of insulin therapy. Teaching that focus on techniques of self-administration of insulin will create awareness and have fewer mistakes during insulin administration.

Information and education gives consequent improvements in knowledge, attitudes, and skills which leads to better control of the disease and is widely accepted to be an integral part of comprehensive diabetes care.[4] More emphasis is given to the standardization and improvement of insulin self-administration technique.

In the present study, only 4% had adequate knowledge and 27% had favorable attitude on insulin therapy, which indicates that educating individuals on insulin therapy is an essential factor in providing knowledge and favorable attitude on insulin therapy.

A similar study done by Surendranath *et al.* shows that 41 (68%) of the study participants had inadequate knowledge, and remaining 19 (32%) of them had moderately adequate knowledge, none of them had adequate knowledge, regarding insulin self-administration among diabetic patients.[5]

Ghannadi *et al.* on finding the effect of knowledge, attitude, and practice on self-management in diabetic patients showed that there was a significant negative correlation between the patients knowledge and attitude on self-care.[6] Studies have demonstrated that only 18% of them were confident in self-administration of insulin.[7] Though the evaluation was done by questionnaire, telephonic contact, and interview method in different period of time, most of the studies did not find adequate knowledge about self-administration of insulin[8,9] Globally, the questionnaire-based study conducted in 423 centers in 23 countries highlighted the higher proportion of glycemic variability related to

improper technique of insulin administration.[10] The major problem with improper technique of insulin administration is lipohypertrophy (LH), which was 12.57% from Indian cohort and significantly related to wrong technique.[11]

At tertiary care center, physician, diabetologist, trained healthcare providers has major role in delivering the awareness about insulin administration. There is a huge gap in insulin administration guidelines and clinical practice in southern India.[12,13]

This gap between the treating physician and diabetic patients can be fulfilled by specially trained healthcare providers like diabetic educators. Indian recommendation for insulin administration technique guidelines implies the proper site, technique of insulin administration, size of needle, disposal of needles, which will be helpful for guiding the beginning practitioners.[14,15] Higher education and economic standard persons, longer duration of diabetic patients have positive attitude toward insulin practice.[16] At primary care level, the general physicians has upper hand in following diabetic patients and adjusting the insulin dosage. There are three aspects to be addressed at primary care level: (1) patient perspective (2) healthcare practitioner-related issues (3) healthcare system---physician and patient's relationship.[17]

Regarding patient-related measures fear of insulin, psychological, social beliefs, risk of hypoglycemia has to be addressed. Cuddihy *et al.* has showed that general physicians has very minimal effort in initiating, adjusting insulin at primary care level.[18] This is because of lack of experience and lack of time to spend with diabetic patients. Here they felt that trained nurses at primary care level can support physicians to manage the patients.[19] Even periodic training programmes for general physician has showed significant changes in post-training knowledge about diabetic complication and insulin administration.[20]

Lastly, there should be an integrated healthcare system, so that physicians, healthcare nurses, patient's relationship will improve and all the barriers at different level will be addressed. General physicians at primary care level should be supported by diabetologist or experienced person at secondary or tertiary care level.

As diabetes is a major burden and a systemic disease in India, the awareness of knowledge, clinical implication about diabetes, and its complication should start from under graduate level as a part of early clinical exposure and learning. This will help in improving standard diabetic care at primary level.

Conclusion

Diabetes mellitus imposes a lifelong threat on the individuals and their families. This study showed the level of knowledge on insulin therapy was inadequate and the attitude among the patients regarding self-insulin therapy was unfavorable. In addition, the study findings revealed that there is an immense need for diabetic education on insulin therapy. Outcomes are largely based on the patient's knowledge and attitude. Therefore, it can be concluded that people with diabetes should receive ongoing need based quality diabetic education by using innovative methods that is tailored to their needs delivered by skilled healthcare providers-diabetic educators.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. Informed consent obtained for participation.

Acknowledgements

Financial support and sponsorship

Conflicts of interest

There are no conflicts of interest.

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