

**KNOWLEDGE, ATTITUDE AND PRACTICE ON
INSULIN ADMINISTRATION AMONG DIABETIC
PATIENTS AND THEIR CAREGIVERS**

by

Shweta Sahu

Roll. No. 0273

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Under the Supervision and Guidance of

Dr. Surya Prakash

Associate Professor, IIHMR University, Jaipur



IIHMR University, Jaipur
1, Prabhu Dayal Marg, near Sanganer Airport
Pin code: 302029, Jaipur (Rajasthan)

DECLARATION BY STUDENT

I hereby declare that this dissertation titled knowledge, attitude and practice on insulin administration among diabetic patients and their caregivers is the record of my original research work. I declare that it has not been submitted to any other university for the award of any Certificate. Information derived from the various published source or unpublished source, or work of any others has been duly acknowledged in the report.

Signature

Shweta Sahu

CERTIFICATE

This is to certify that dissertation titled knowledge, attitude and practice on insulin administration among diabetic patients and their caregivers is a record of the research work by **Shweta Sahu, Roll no. 0273**, in fulfillment of the requirement for the completion of the degree of MBA (PM) School of Pharmaceutical Management ,IIHMR University, Jaipur under my guidance and supervision and I believe her approach for this study or dissertation has been sincere and analytical.

Faculty Guide:

Dr. Surya Prakash
Associate Professor,
IIHMR University, Jaipur

Date

School Dean:

Saurabh Kumar
Banerjee,
Dean SPM,
IIHMR University,
Jaipur

Date

ABSTRACT

The study aimed to analyze the perception of insulin administration among the Diabetic patients and their caregivers. A chronic metabolic disorder which is incurable but can be managed by adopting the proper treatment of insulin intake and thus brings down the shootd HbA1c target in our body. Diabetes carries a hub of many more complications with itself and leads to higher risk for many serious health conditions in both acute and chronic ways. Insulin serves as a miracle to achieve the HbA1c targets and maintain a proper balance of FPG and PPG in our body which the OAD's fail to attain.

A self-administered form was prepared and distributed to fifty Doctors and fifty Patients. In the questionnaire all the basic questions to analyze the KAP of insulin were mentioned like the type of insulin preference by the people, fear of insulin administration, comparison of insulin with the oral anti diabetic drugs, cost factor of insulin therapy and the resistance of adopting the insulin therapy.

The results obtained from the study are informative and helped us to understand the major fear and lack of understanding about the insulin and the social stigma with which everyone is living and helped us in developing a proper strategy and solution for enhancing the knowledge of people by pharmaceutical companies, they will drive the strategies for the insulin education among the people and in turn guide doctors to follow the same.

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CHAPTER 1

INTRODUCTION

1.1. Diabetes:

Diabetes is a chronic progressive metabolic disease or health condition in which the regulation of blood sugar is affected. The pancreas which are responsible for the production of insulin either fail in the insulin production or our body is unable to use insulin effectively which has been produced.

Hyperglycemia is probably the condition which occurs in diabetes and can lead to serious macrovascular and microvascular complications.

Classification:

Generally 3 types of diabetes are there: Type 1 Diabetes, Type 2 Diabetes, Gestational Diabetes Mellitus (GDM) and Other specific types

Type 1/ Diabetes insipidus: It is also named as juvenile onset in which our body's pancreas is unable to produce enough insulin. Thus, insulin needs to be administered from outside of the body.

Type 2/ Diabetes Mellitus: It is also named as non-insulin dependent diabetes. It's a condition in which the cells become resistant to take up the glucose and in unequal amount the insulin is produced in the body. This can be treated by taking oral anti diabetic drugs and insulin administration.

Type 3/ Gestational Diabetes: It is diabetes during pregnancy. In some cases, the physiologic stresses during pregnancy may initiate diabetes, whereas in other woman, pre-existing diabetes may first be recognized during the medical

exams that accompany pregnancy. This can be treated by diet, while others require insulin therapy.

Type 4/Others: Other specific types of diabetes

Generic defects of beta-cell function and insulin action, endocrinopathies, drug or chemical induced defect.

Feature	Type 1	Type 2
Occurrence	Not so common (5-25%)	Generally common (75-95%)
Diagnosis Age	Commonly during childhood and adolescence	Commonly in adults
Onset	Acute	Gradual
Body Weight	Mostly lean	Mostly Obese
Genetically	Linked	Predisposed
Core Defect	Autoimmune destruction of beta cells- Absolute insulin deficiency	The cells become resistance to take insulin and beta cells stop functioning
Ketosis	More prone to DKA	More prone to HONK
Management	Insulin required for survival	Diet, Exercise, OAD's, GLP-1 RA and/or insulin.

Table 1: Different types of Diabetes (type 1 and 2)

1.2. Complications:

Diabetes carries a hub of many more complications with itself, leads to higher risk for many serious health conditions in both acute and chronic ways. Insulin serves as a miracle to achieve the HbA1c targets and maintain a proper balance of FPG and PPG in our body which the OAD's fail to attain.

Acute complications include the state of Hypoglycemia, Diabetic Ketoacidosis (DKA), HONK (Hyperosmolar non-ketotic coma) and HHS (Hyperosmolar hyperglycemic State).

Chronic complications include **Microvascular** complications like Retinopathy, Neuropathy and Nephropathy. On the other hand, **Macrovascular** complications leads to coronary artery diseases, Cerebro Vascular Accident/Stroke, Peripheral Artery/Vascular Disease.

So, this entire hub of complication is enough for the death of an individual. Though, we cannot cure diabetes, but management of diabetes is in our hands and insulin serves as a miracle to achieve the HbA1c targets and maintain a proper balance of FPG and PPG in our body which the OAD's fail to attain. And in fact, even 1% of HbA1c reduction helps in prevention of diabetes related complication and will boom the life journey of patient.

Thus, Start and intensify with insulin is all that is required.

1.3. Insulin:

Structure of insulin

There are 2 chains present in insulin A chain and B chain. A chain consists of 21 amino acids and the B chain of 30 amino acids.

Physiology & Mechanism of Action

Insulin is produced in the Beta-cells of pancreas. Insulin therapy is vital option for managing diabetes.

Insulin is the energy forming hormone which serve as a transport system to drive the glucose molecule produced in our body to the cells and in turn generate ATP and thus, producing energy out of it.

Insulin is an anabolic hormone. It is continuously secreted in small (basal) amounts, but its level rises rapidly in response to increased levels of glucose and amino acids in the blood, especially after a meal.

Insulin stimulates storage of excess nutrients: glucose as glycogen, fatty acids and glycerol as triglycerides and amino acids as proteins. The main function of insulin in our body is to control glucose concentration to avoid peaks that can be damaging to cells and that would lead to loss of glucose in the urine.

Mechanism of insulin release

Insulin release by the pancreatic beta cells is regulated by blood glucose levels, with increased levels stimulating both synthesis and secretion of insulin. Pancreatic beta cells secrete insulin only when blood glucose levels gets high i.e. go above the fasting levels. Fusion of the membranes allows the insulin inside the secretory granule to diffuse across the capillary membrane into the bloodstream (exocytosis).

Types of insulin produced in body:

Basal: This insulin is released during empty stomach or during fasting.

Also called as background insulin which keeps blood glucose concentration at fixed levels during various phases of fasting.

Bolus: This insulin in our body is released between mealtime.

A bolus dose is a type of insulin which is specifically consumed during mealtimes to keep blood sugar levels under control following a meal.

.Location of insulin action:

Insulin acts at three areas:

- 1. Liver:** In liver insulin inhibits the glucose formation helps in the storage of glycogen.
- 2. Muscle:** in muscles insulin helps in uptake and utilization of glucose wherever required.
- 3. Adipose Tissue:** Insulin suppresses lipolysis process.

Incretins:

These are the gut hormones secreted from the cell of distal ileum and colon, that potentiate insulin secretion after meal ingestion in a glucose dependent manner. It will work when the glucose level in the body is high. Incretins are also known as GLP -1 (Glucagon like peptide) and has its better physiological and pharmacological property.

Test for insulin determination:

- 1. FPG:** this is the test done in empty stomach.
- 2. PPG:** this test is done after the meal.
- 3. HbA1c:** This test is done at the morning time. It will give us the value of sugar level of the patient in past 3 months.

Parameters	FPG (mg/dl)	PPG (mg/dl)	HbA1c (%)
Normal Values	72-99	<140	4-5.6
Pre-diabetes	100-125	140-199	5.7-6.4
Diabetes	≥ 126	≥ 200	≥ 6.5
Treatment targets	80-130	<180	<7.0

Table 2: Blood Glucose Levels

Site of insulin injection:

There are three sites for insulin injection:

1. Abdomen (around the umbilicus)
2. Front of thigh
3. Gluteal region

Insulin regimes:

- 1. Basal only:** (in combination with OAD's): One dose of basal insulin is given at bedtime.
- 2. Basal- Bolus therapy:** One dose of basal insulin at bedtime and three dose of short acting insulin before each major meal.
- 3. Premixed therapy:** Two dose of premixed insulin, one in the morning and one in the night-time with the major meal.
- 4. Co-formulation:** one dose of insulin in the morning.

CHAPTER 2

LITERATURE REVIEW

- NGSM Institute of Pharmaceutical sciences, Nitte (Deemed to be University), Mangalore researched on various diabetic patients . The average age of patient was around 55 years. The results showed that the mean KAP score was 65.05, which is less and most of the patients had not controlled their glycaemic levels. (Sunny Anu, Volume 12, 2021)
- Mettu and BH University along with Mr. Tsegaye Workneh Fego (MA Candidate) conducted a cross-sectional study by a consecutive sampling technique at Bedele Hospital from 15 December 2019 to 22 January 2020. Response rate was 92% and The study reveals that knowledge, attitude, and practice towards insulin self-administration were 132 (67.3%), 113 (57.6%), and 123 (62.8%), receptively, which implies that good knowledge, a favorable attitude, and good practice to insulin self-administration. (Workneh Melese, 2019/2020)
- Sourav Das Choudhury, Somak Kumar Das, Avijit Hazra conducted a study to assess knowledge, attitude, and practice regarding insulin use

among diabetic patients in tertiary care hospitals. (Das Choudhary S, 2014, Aug 26)

CHAPTER 3

RESEARCH QUESTION

Should Biopharmaceutical Companies work more on the Insulin Compliance to make people more acceptable towards insulin use?

CHAPTER 4

OBJECTIVES

- To assess the knowledge and understanding of the HCP's and people towards Insulin.
- To analyses the first and most frequent therapy adopted by doctors to resume Insulin.
- To analyses the acceptance of insulin compared to OAD's.

CHAPTER 5

METHODOLOGY

5.1. Study design:

A cross-sectional study design was accustomed to verifying the data of patients and doctors regarding the insulin administration. The data is collected from the people of Chhattisgarh specially the Raipur region.

5.2. Method:

A structured questionnaire was used for the people including doctors and patients with the aim of assessing the knowledge Attitude and practice of insulin administration in these population.

This can be a cross-sectional survey distributed through google form in rural and urban areas region. The individuals concerned during this study were adults, and elders. A predesigned questionnaire was used for the conduct of the study. To facilitate this study the form was translated into English and Hindi throughout the interview of patients and to maximize the result validity. as a result of most of the patients didn't understand English that the queries were asked in their native language. The variable is age.

5.3. Study tool:

For the aim of the study, a pre-designed form was ready and accustomed get the information concerning the knowledge attitude and perception of insulin administration.

5.4. Study Sample and setting:

The size of this study was 100 (50 patients and 50 doctors) which was collected online through the response of google forms and they were given the consent form regarding the confidentiality of their response which is to be maintained.

CHAPTER 6

RESULTS AND FINDINGS

We analyzed the study of knowledge, attitude and practice of insulin among various diabetic patients and their caretakers resulted with the following results:

1.1. PATIENT'S PERSPECTIVE TOWARDS INSULIN THERAPY:

Are you aware of different types of Diabetes?

Are you a Diabetes patient?
50 responses

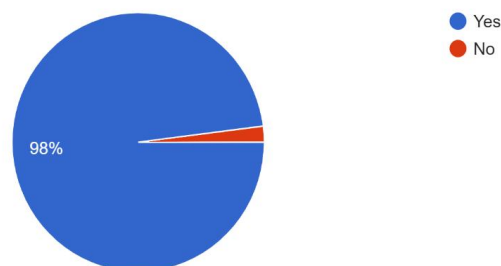


Figure 1: Awareness of Diabetes

According to the survey done almost 98% of the people are aware about the diabetes and 2% of the population are unaware of diabetes.

At what age you were diagnosed with Type 2 Diabetes?

At what age you were diagnosed with Type 2 diabetes?
50 responses

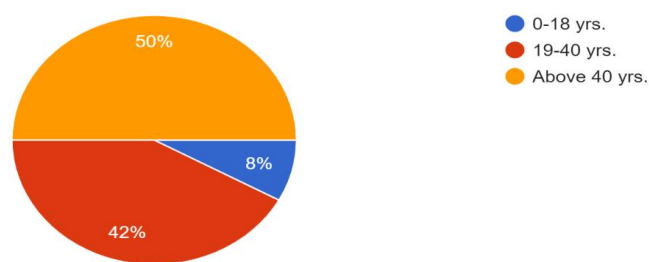


Figure 2: Diagnosis of diabetes at different age group

Half of the patients, around 50% above 40 years were diagnosed with Type 2 diabetes followed by 42% of patients at the age group 19-40 years were also prone to Type 2 diabetes and around 8% of the population were less prone to Type 2 diabetes.

What do you think is more compatible, Oral Anti diabetic drugs/Insulin?

What do you think is more compatible, Oral Anti diabetic drugs/Insulin ?

50 responses

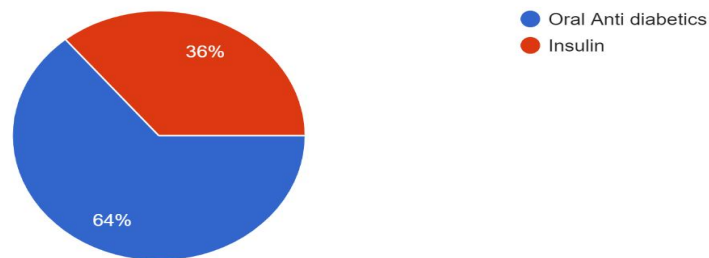


Figure 3: Patients Compatibility towards OAD's and Insulin

According to the survey done Oral anti diabetic drugs are more compatible to patients than the insulin therapy.

At what age you have started Insulin therapy?

At what age you have started insulin therapy?

50 responses

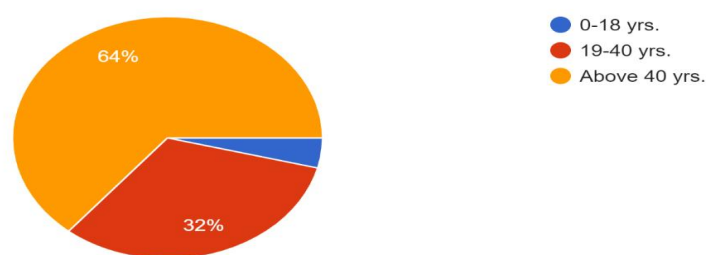


Figure 4: Different age group depicting initiation of insulin therapy

According to the survey maximum number of patients whose HbA1c doesn't gets controlled by OAD's start the insulin. And the onset of insulin therapy is delayed at the age of 40 and above the patients are initiated into the insulin therapy. 64% patients have started insulin intake above the age of 40, 32% at the age of 19-40 and very less patients are administered insulin between the age of 0 to 18 years.

Do you face any fear while administering insulin?

Do you face any fear while administering insulin?
50 responses

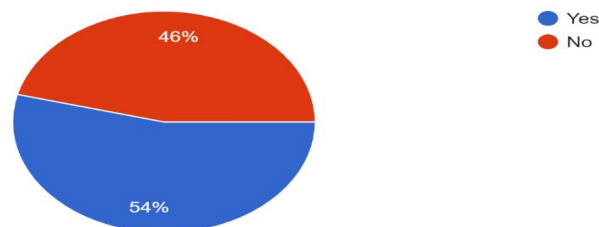


Figure 5: Fear of administering insulin therapy

Almost 54% patients still have the fear while administering insulin and the ones who are already use to it like around 46% of patient do not fear anything while administering the insulin.

Do you face any social stigma while administering insulin therapy?

Do you face any social stigma while administering insulin therapy?
50 responses

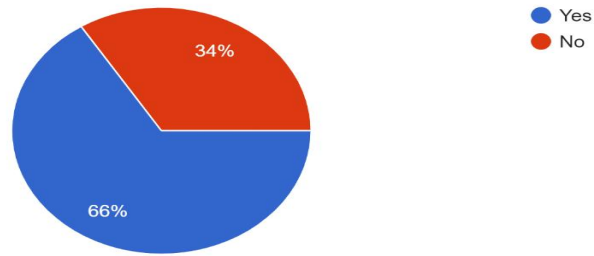


Figure 6: Social Stigma while administering insulin therapy

The mentality of the people has been set in such a way that they think if insulin therapy is started, they came to the last stage of their life. He tries to think what society will think about me. Thus almost 66% of the patient face social stigma while administering insulin.

In which insulin you more rely?

In which insulin you more rely?
50 responses

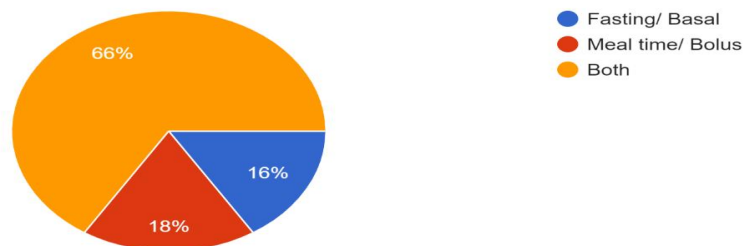


Figure 7: Patient's dependence on different types of insulin

In India people take high carbohydrate diet, they have high PPG concern and are uncontrolled on multiple OAD's thus, 66% of the patients rely on both i.e., premix insulin which covers both FPG and PPG and 18% on mealtime insulin and rest 16% on FPG or basal insulin.

Is insulin therapy beneficial for you to achieve your HbA1c targets?

Is insulin therapy is beneficial for you to achieve your Hba1c targets?
50 responses

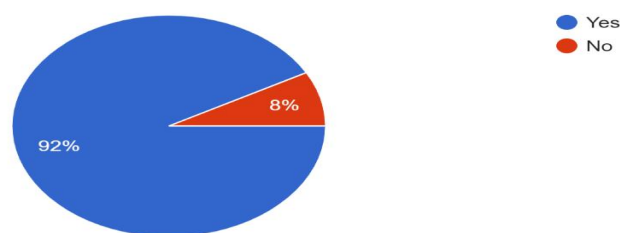


Figure 8: Agreement of insulin therapy for achieving HbA1c targets

Insulin is the only solution for the diabetes patient which will reduce their shouted HbA1C in target and maintain the sugar level in the body. Thus, 92% of the patients agree on the terms that the insulin is beneficial to achieve the HbA1c targets in our body.

According to you is insulin a costly therapy?

According to you is insulin a costly therapy?
50 responses

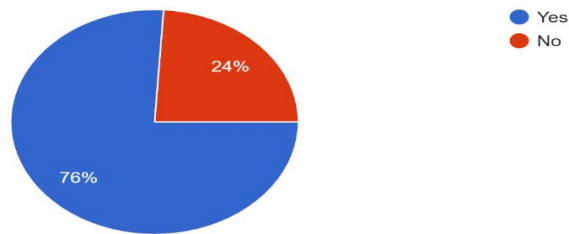


Figure 9: Response on costly therapy of insulin

Though the insulin is the best solution and a life saver for diabetes patients, but it is also a costly therapy which everyone can't afford. Thus, 76% of the patients are agreeing on the terms that insulin is a costly therapy.

1.2. DOCTOR'S PERSPECTIVE TOWARDS INSULIN THERAPY:

What obstacle do you face for starting an insulin therapy?

What obstacles do you face for starting an insulin therapy?
50 responses



Figure 10: Obstacles faced for initiating insulin therapy by doctor's

According to the doctor's perspective the efficiency or compatibility of insulin serve as a major barrier for initiation followed by high cost of insulin and disagreement by the patients for switching from OAD's to insulin.

After 3 multiple OAD failures what is the starting insulin choice?

After 3 multiple OAD failures what is the starting insulin choice?
50 responses



Figure 11: Starting choice of insulin after 3 multiple OAD failure

According to the doctors after 3 multiple OAD failure adding a fourth OAD won't help thus they switch directly into the basal insulin for attaining the HbA1c target and to premix or co formulation insulin which covers both PPG and FPG and a negligible amount of doctor's switch to Bolus after the OAD's.

Is insulin therapy able to achieve the results?

Is insulin therapy able to achieve the results?
50 responses

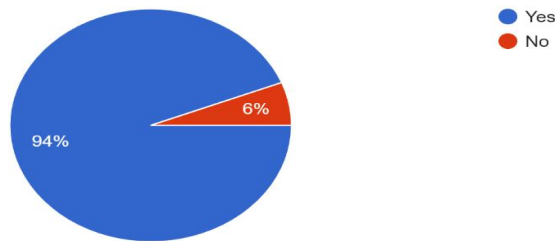


Figure 12: Result achievement of insulin therapy

Insulin the best for achieving the HbA1c targets, 94% doctors agree on this term and rest 6% still prefer OAD as a choice.

Is insulin better than OAD's?

Is insulin better than OAD's?
50 responses

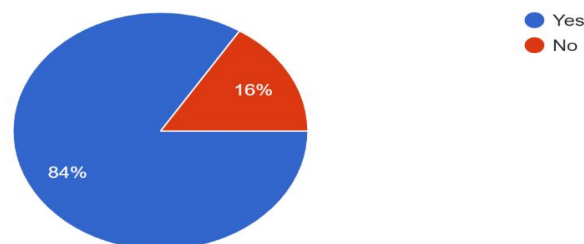


Figure 13: Response of OAD's v/s Insulin

About 84% of the doctors agree on the terms that insulin is better than OAD's.

How frequently you titrate the dose of basal insulin?

How frequently you titrate the dose of Basal insulin?
50 responses

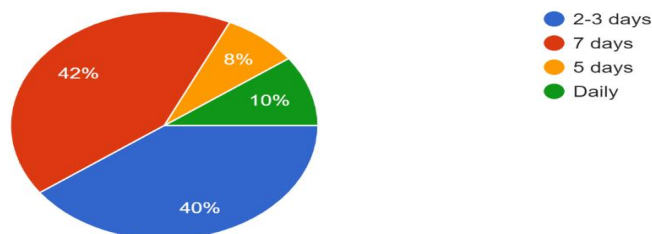


Figure 14: Titration of basal insulin dose

42% of the doctors use to titrate the insulin dose once a week and around 40% follows the schedule of 2-3 days of dose titration and around very less like 10% of them titrate daily and around 8% of doctors titrate the dose once in 5 days.

At which HbA1c level you initiate insulin therapy?

At which HbA1c level you initiate insulin therapy?
50 responses

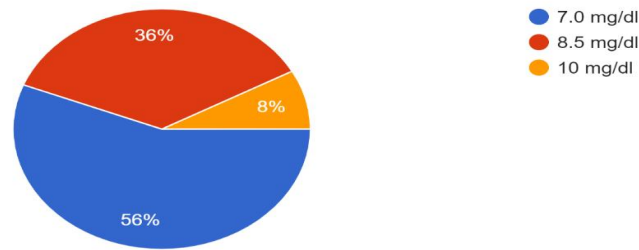


Figure 15: Initiation of insulin therapy at different HbA1c

When the HbA1c reaches 7 mg/dl the doctors initiate the insulin therapy as it indicates that the patient is uncontrolled on OAD's and 365 of doctors initiate at 8.5 mg/dl and very few initiate insulins therapy after 10 mg/dl.

Is insulin a costly therapy?

Is insulin a costly therapy?
50 responses

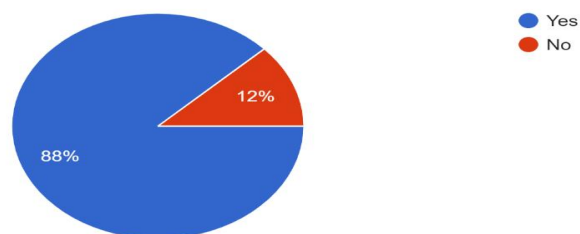


Figure 16: Responses on costly therapy of insulin

According to the survey though insulin is the best for diabetic patient still it is costly therapy. Almost 88% doctors' belief that it is costly therapy.

CHAPTER 7

CONCLUSION

According to the survey done on KAP analysis on Insulin administration among diabetes patient and their caregivers we came up with results paving way for the better understanding and compliance for the insulin administration.

Patients' perspective about the knowledge of diabetes were very impressive. As diabetes has taken created a hub in this world. One in every 10 people must be suffering from diabetes.

- It was observed that the diagnosis of diabetes has been a major challenge. After the survey it was analysed that after the age of 40 maximum people are prone to diabetes least below 18 years.
- Perception of taking Anti diabetes drugs instead of insulin is still prevalent now, Patients want to be on oral drugs al, the time even if the sugar didn't get controlled.
- OAD's are unable to achieve the HBA1c targets, when a person fails on multiple OAD's then adding one more OAD serve as barrier to control the sugar level as because the beta cells become resistant after a point of time and thus, the OAD's fail to work anymore.

Then the insulin needs to be administered and it has been seen that after the age of 40 maximum insulin initiation takes place around 64% and in

between the age of 19 to 40 years around 32% of the patient gets started in insulin therapy.

- There is a huge fear and social stigma while initiating insulin therapy as patients fear that if they are started on insulin there is no way of going back, they have reached to the last stage of their life. Half of the patients (54%) fear while administering insulin as they don't want to take injection every day. And also, they think about the society like what people will think while seeing them administering insulin injection anywhere.
- As we know the Indian reality we take high carbohydrate diet, we have high PPG concern and patients are uncontrolled on multiple OAD's. We need simplicity and convenience in our diet. Thus, FPG and PPG both serve as a major concern in Indian patients. Thus, 66% of the patient reply on the premix insulin (which covers both PPG and FPG) and also the basal insulin or Fasting is also the concern, 18% patient rely on fasting insulin and almost 16% rely on mealtime I.e., bolus insulin.
- Survey also gave us insights on believing that insulin is able to achieve the HbA1c targets. It brings up the shooter HbA1c to a bare minimum and keeps the sugar level in control. There is 1.7% HbA1c reduction if you shift your patient from OAD's to Insulin.
- After all the benefits of insulin it is a costly therapy as per patients, not everyone can afford the cost of insulin thus, people are reluctant to switch from OAD's to insulin.

Doctor's perspective :

The main obstacle faced by the doctors for starting/initiating the insulin therapy is the compatibility issue. Doctors think that the patient will get control on OAD's and thus take long time to start the insulin therapy when they are unable

to attain the sugar targets, cost of insulin also serves as a barrier as patients don't want to pay a huge amount of money for the controlling diabetes and also the patient don't want to switch in insulin, they want to remain lifetime in OAD's and get their diabetes in controlled.

- The starting insulin choice by the doctors when the patient fail on multiple OAD's is first and foremost is basal insulin as doctor first want to get the FPG of the patient in control and for the PPG control he prescribes OAD to his patient. Around 52% of the doctors prefer to initiate with basal insulin as a choice.

And around 46% of the doctors initiate with premix insulin as the concern is both FPG and PPG control in the patient. So, premix (which contains both basal and Bolus insulin) is the preferred choice after OAD failure.

- Doctors also belief that the insulin is the key to prevent diabetes, the maximum HbA1c reduction we can get is only through insulin. As in diabetes what happens there is the deficiency of insulin and if we give the analogue i.e., insulin from outside it will surely show the results and also prevents the macro and micro vascular complications which gets occurred by continuous administration of OAD's to the patient. In a long run insulin is the only option to go with if the life of the patient needs to be sustained.

- After initiating with the insulin therapy, the titration of insulin is the crucial factor otherwise the patient will go in hypoglycaemia state.

According to the survey 42% of the doctor's titration the dose of insulin in a week i.e., 7 days. And 40% of the doctors titrate the dose in 2-3 days. On daily basis titration is done by 10% of doctors and around 8% of the doctors titrate the insulin dose in 5 days of interval.

- After the failure of OAD's the doctors initiate the insulin. It was found that 56% of the doctor's start the insulin therapy at HbA1c 7.0 mg/dl and

36% of the doctor's initiate insulin at HbA1c 8.5 mg/dl and only 10 % of doctors initiate insulin therapy at HbA1c 10 mg/dl.

Early initiation of insulin is recommended to prevent the macro and micro vascular complications and keep the sugar in control.

- Though the insulin can achieve the HbA1c targets it is still proven a costly therapy by Doctor's and thus, they don't want to put their patient on insulin because of the cost factor and look on short term benefits of OAD's and at last initiate insulin when the sugar gets uncontrolled.

CHAPTER 8

DISCUSSION AND RECOMMENDATIONS

According to the survey the following suggestions can be made to the bio pharmaceutical companies to make the insulin more compliant to the patient:

- Insulin education to be provided to the patients. Campaigns must be carried out by the biopharmaceutical companies to create awareness about the benefits of insulin to the patients, including doctors and para medical staff.
- Insulin pen must be designed in such a way so that the patient faces a minor pain when pricked with insulin.
- No. Of pricks should be reduced by working more on premix insulin analogues.
- Once in a week insulin injection must be designed to make it more convenient for patients use.
- A simple and convenient pen must be design for patient use.
- Cost of insulin should be made affordable.
- Device demonstrator and diabetes educator must be allotted to the doctors to deliver the benefits of insulin.

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ANNEXURE:

QUESTIONNAIRE FOR PATIENTS:

Survey on KAP analysis of insulin administration by Patients.

My name is Shweta Sahu, student of IIHMR University, Jaipur. I am conducting this survey as a part of my dissertation project needed for the completion of my post graduation degree. I am requesting you to provide your views on the SURVEY ON KAP ANALYSIS OF INSULIN ADMINISTRATION BY PATIENTS. Please answer the question by due responsibility. I hereby assure you that all the information provided by you will be confidential and will be just used for research purpose. I am looking forward for your cooperation and thankyou for your participation.

Name



Short answer

Short answer text



Required



Are you aware of Type 1 and Type 2 Diabetes ? *

☐ Yes

☐ No

At what age you were diagnosed with Type 2 diabetes? *

☐ 0-18 yrs.

☐ 19-40 yrs.

☐ Above 40 yrs.

What do you think is more compatible, Oral Anti diabetic drugs/Insulin ? *

☐ Oral Anti diabetics

☐ Insulin

At what age you have started insulin therapy? *

☐ 0-18 yrs.

☐ 19-40 yrs.

☐ Above 40 yrs.

Do you face any fear while administering insulin? *

☐ Yes

☐ No

Do you face any social stigma while administering insulin therapy? *

☐ Yes

☐ No

In which insulin you more rely? *

☐ Fasting/ Basal

☐ Meal time/ Bolus

In which insulin you more rely? *

- ☐ Fasting/ Basal
- ☐ Meal time/ Bolus
- ☐ Both

Is insulin therapy is beneficial for you to achieve your Hba1c targets? *

- ☐ Yes
- ☐ No

According to you is insulin a costly therapy? *

- ☐ Yes
- ☐ No
-

QUESTIONNAIRE FOR DOCTOR'S:

Survey on KAP Analysis of insulin administration by Doctors.

My name is Shweta Sahu, student of IIHMR University, Jaipur. I am conducting this survey as a part of my dissertation project needed for the completion of my post graduation degree. I am requesting you to provide your views on the SURVEY ON KAP ANALYSIS OF INSULIN ADMINISTRATION BY DOCTORS. Please answer the question by due responsibility. I hereby assure you that all the information provided by you will be confidential and will be just used for research purpose. I am looking forward for your cooperation and thankyou for your participation.

Name *

Short answer text

What obstacles do you face for starting an insulin therapy? *

- ☐ Cost of insulin therapy
- ☐ Disagreement by patient
- ☐ Efficiency/Compatibility of insulin therapy

After 3 multiple OAD failures what is the starting insulin choice? *

- ☐ Basal
- ☐ Bolus
- ☐ Premix/ co-formulation

Is insulin therapy able to achieve the results? *

☐ Yes

☐ No

Is insulin better than OAD's? *

☐ Yes

☐ No

How frequently you titrate the dose of Basal insulin? *

☐ 2-3 days

☐ 7 days

☐ 5 days

☐ Daily

At which HbA1c level you initiate insulin therapy? *

☐ 7.0 mg/dl

☐ 8.5 mg/dl

☐ 10 mg/dl

Is insulin a costly therapy? *

☐ Yes

☐ No