Perception of insulin therapy among patients with type 2 diabetes mellitus in Jos, North Central Nigeria

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Abstract

Background -The implementation of insulin in the management of type 2 diabetes mellitus is often necessary for better glycaemic control. However, many still consider insulin therapy as the last resort. Several factors come to play in the acceptance of insulin as a form of therapy by patients. This study evaluated the perception of insulin therapy among patients with type 2 diabetes mellitus.

Methods- This was a descriptive cross-sectional study carried out at the Jos University Teaching Hospital (JUTH) Jos, North Central Nigeria. One hundred and eighty five persons (100 insulin naïve persons and 85 persons on insulin) were recruited consecutively. The insulin treatment appraisal scale (ITAS) was used to evaluate the perception of insulin therapy among these patients

Results- fifty five (64.7%) females were on insulin while 64 (64%) were insulin naïve. The mean age was 52 ± 11 years and 59 ± 10 years in those on insulin and insulin naïve persons respectively. Twenty one (24.7%) persons on insulin and 33 (33%) insulin naïve persons had tertiary level of education. Insulin naïve persons had higher mean total score of the 20 items, total score of the 16 negative items and total score of the 4 positive items compared with persons on insulin. Among persons on insulin, those with less than one year of education had a better perception of insulin therapy compared with persons who had six years or more of education; Duration of insulin use, gender and age had no impact on perception of insulin therapy.

Conclusion- The perception of insulin therapy among persons with type 2 diabetes mellitus is poor.

Introduction

New recommendations for the management of type 2 diabetes call for more rapid initiation of both antidiabetic agents and insulin therapy[1]. The implementation of insulin in the management of type 2 diabetes mellitus is often necessary for better glycaemic control which is essential to prevent long term complications[2]. In certain group of patients, early initiation of insulin may prevent future complications from arising[3]. Although most providers agree that insulin is an efficacious approach to the management of type 2 diabetes mellitus, many still consider insulin therapy as the last resort and indicate that their patients are hesitant to take insulin[4]. There are many factors influencing delayed insulin initiation including those caused by health care providers and its system, as well as the patients[5-7]. One of the main barriers is psychological insulin resistance (PIR), defined as psychological opposition towards insulin use among patients and healthcare providers[6,8,9]

Several factors come to play in the acceptance of insulin as a form of therapy by patients. Hassan et al[10] in Malaysia found concerns related to injections (self injection, fear and pain of injection), insulin use (inconvenience, embarrassment, self restriction, negative social stigma and poor self efficacy) and beliefs (insulin could cause organ damage, insulin is lifelong, insulin is for severe disease only and their diabetes is not severe enough) to be factors influencing insulin acceptance among these patients. Another study by Wong et al[11] in Singapore also found barriers to include factors associated with injection, insulin use and beliefs of the people.

In Nigeria, Ogbera and Kuku[12] found factors associated with non adherence to insulin to include health related cost, age, duration of diabetes mellitus and insulin associated side effects. Even though patients with type 2 diabetes are counseled at the point of diagnosis to accept insulin as a drug that will likely be added in the course of the disease, we do not know the perception of insulin among these patients. We therefore embarked on this study to determine the perception of insulin therapy among these patients.

Materials and Methods

This descriptive cross-sectional study was carried out at the Diabetes Clinic of the Jos University Teaching Hospital between September 2015 and April 2016. One

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hundred and eighty five patients with type 2 diabetes, aged 30 years and above who consented to the study were recruited consecutively (100 insulin naïve persons and 85 persons on insulin). The insulin treatment appraisal scale (ITAS)[13] questionnaire was used to collect data to evaluate the perception of insulin therapy in this study. This instrument has been validated among Caucasians with type 2 diabetes mellitus and found to be useful in naïve and insulin treated patients to assess positive and negative perceptions regarding insulin treatment with the perception being more negative in the insulin naïve patients[13]. ITAS has 20 items (16 negative and 4 positive) scored on a five point Linkert scale, where strongly disagree=1, disagree=2, neither agree nor disagree=3, agree=4, strongly agree=5. The four positive items (questions 3, 8, 17, 19) were rated on the reverse with strongly disagree=5, disagree=4, neither agree nor disagree=3, agree=2, strongly agree =1. The total positive score is 100 with higher scores indicating a negative appraisal of insulin therapy.

Further data was collected including demographics, level of education, duration of diabetes, duration of insulin use and level of education. This questionnaire has not been used in Nigeria before now to the best of our knowledge. Three members of the team collected the data and interpreted to Hausa and pidgin languages for patients that do not understand English language

Statistical Analysis
Statistical analysis was done using Epi info 3.5.3. Continuous variables were expressed as means ± SD and categorical variables were expressed as proportions. Chi square test was used to compare categorical variables. Where the expected frequency of a cell was <5, Fisher's exact test was used. In all cases, p- value of <0.05 was considered statistically significant.

Ethical Consideration
Written and informed consent was gotten from all participants. Information concerning all participants was treated with confidentiality.

Results
A total of 185 patients (100 insulin naïve persons with 85 persons on insulin) were enrolled for this study. The age range of participants was 30-85 years with the mean ± SD being 52 ± 11 and 59 ± 10 years in those on insulin and insulin naïve persons respectively, insulin naïve being significantly older (p=<0.001). Seventeen (20%) persons on insulin and 32 (32%) insulin naïve persons were elderly (≥ 65 years), the middle aged being the majority (61% insulin naïve and 49.4% persons on insulin). There were 119 (64.3%) females in this study with male to female ratio being 1:1.8. Twenty five (29.4%) persons on insulin and 31 (31%) insulin naïve persons had no formal education while 21 (24.7%)

persons on insulin and 33 (33%) insulin naïve persons had tertiary education. The differences observed were not statistically significant (p==0.48). More persons on insulin had diabetes for more than ten years while the insulin naïve persons had the same number of persons with diabetes for 6-10 years and more than 10 years (p==0.22) (Table 1)

Table 1: Characteristics of the study subjects

Characteristics	Persons on insulin	Insulin naïve persons	Total	P-value
Age in years (mean)	52.3(11.7)	59.3(10.8)		<0.001
	n (%)	n (%)	n (%)	
Age group (years)				
30-44	26 (30.6)	7 (7)	33 (17.8)	<0.001
45-64	42 (49.4)	61 (61)	103(55.7)	
≥65	17 (20)	32 (32)	49 (26.5)	
Sex				
Females	55 (64.7)	64 (64)	119 (64.3)	0.52
Males	30 (35.3)	36 (36)	66 (35.7)	
Education level				
None	25 (29.4)	31 (31)	56 (30.3)	0.48
Primary	27 (31.8)	23 (23)	50 (27.0)	
Secondary	12 (14.1)	13 (13)	25 (13.5)	
Tertiary	21 (24.7)	33 (33)	54 (29.2)	
Duration of DM in years (median)	10 (0.25-30)	9 (0.25-28)		0.14
Duration of DM group (years)				
<1	4 (4.7)	6 (6)	10 (7.0)	0.22
1-5	18 (21.2)	28 (28)	46 (24.9)	
6-10	22 (25.9)	33 (33)	55(29.7)	
>10	41 (48,2)	33 (33)	74(40.0)	

Table 2 shows a significant statistical difference in all questions except numbers 1,9 and 18 (taking insulin means I have failed to manage my diabetes with diet and tablets, insulin causes weight gain and being on insulin causes family and friends to be more concerned about me respectively). It also shows that the total mean score is higher in insulin naive persons than in insulin treated persons (56.7 ± 9.6 Vs 42.8 ± 11.2) = <0.001) with the total mean score of the 16 negative items also higher in the same group (47.3±9.2 vs 35.7±9.9 p=<0.001).

Table 3 compares some variables and total negative scores among persons on insulin. It shows no significant difference in mean total negative score between men and women, duration of insulin use and age of the patients. There was however a difference in the mean total negative score of the level of education between those with up to six years of education and those with more than six years of education p=0.0003.

Table 2- ITAS scores for insulin treated and insulin naive persons

		Persons on insulin		Insulin naïve persons		
		Mean (SD)	Agree/strongly agree %	Mean (SD)	Agree/strongly agree %	P-value
Q1	Taking insulin means I have failed to manage my diabetes with diet and tablets	3.0 (1.2)	45.9	3.3 (1.3)	49	0.12
Q2	Taking insulin means my diabetes has become worse	3.2 (1.2)	60	3.6 (1.5)	60	0.04
Q3	Taking insulin helps to prevent complications of diabetes	1.9 (1.0)	86	2.3 (0.8)	64	0.006
Q4	Taking insulin means other people see me as a sicker person	2.8 (1.3)	45.9	3.4 (1.2)	54	0.002
Q5	Taking insulin makes life less flexible	2.0 (1.1)	18.8	2.9 (1.1)	30	<0.001
Q6	I am afraid of injecting myself with a needle	1.9 (1.3)	18.8	3.0 (1.3)	49	<0.001
Q7	Taking insulin increases the risk of low blood glucose levels (hypoglycaemia)	2.3 (1.3)	25.9	3.1 (1.0)	38	<0.001
Q8	Taking insulin helps to improve my health	1.7 (0.8)	94.1	2.2 (0.8)	71	<0.001
Q9	Insulin causes weight gain	2.6 (1.2)	27	2.8 (0.9)	14	0.2
Q10	Managing insulin injections takes a lot of time and energy	1.8 (1.2)	16.4	3.0 (1.0)	35	<0.001
Q11	Taking insulin means I have to give up activities I enjoy	1.6 (0.8)	7.1	2.7 (1.0)	20	<0.001
Q12	Taking insulin means my health will deteriorate	1.5 (0.7)	2.4	2.4 (0.9)	11	<0.001
Q13	Injecting insulin is embarrassing	1.7 (1.1)	11.7	2.2 (1.0)	13	0.0008
Q14	Injecting insulin is painful	2.4 (1.3)	31.7	3.3 (1.2)	58	<0.001
Q15	It is difficult to inject the right amount of insulin correctly at the right time everyday	1.9 (1.2)	18.8	2.8 (1.1)	27	<0.001
Q16	Taking insulin makes it more difficult to fulfill my responsibilities (at work, at home)	1.6 (1.0)	8.3	2.5 (1.0)	16	<0.001
Q17	Taking insulin helps to maintain good control of blood glucose	1.6 (0.9)	94.1	2.3 (0.8)	65	<0.001
Q18	Being on insulin causes family and friends to be more concerned about me	2.9 (1.4)	50.6	3.2 (1.1)	48	0.09
Q19	Taking insulin helps to improve my energy level	1.7 (0.7)	93	2.6 (0.8)	47	<0.001
Q20	Taking insulin makes me more dependent on my doctor	2.6 (1.3)	38.9	3.0 (1.1)	36	0.03
	Mean total score of 16 negative items	35.7 (9.9)		47.3 (9.2)		<0.001
	Mean total score of 4 positive items	6.9 (2.3)		9.4 (2.2)		<0.001
	Mean sum of total score (16 negative and 4 positive)	42.8 (11.2)		56.7 (9.6)		<0.001

ITAS- Insulin treatment appraisal scale

Table 3 - Relationship between some variables and the total negative score among persons on insulin

Variables	Means(SD)	P value
Age groups(years)		
<45	35.7 9.7)	1.00
45-64	35.6 (10.4)	
≥ 65	35.8 (9.4)	
Sex		
Females	35.1(10.2)	0.50
Males	36.6 (9.4)	
Duration of insulin use(years)		
<1	35.6(11.4)	0.55
1-5	36.8(9.1)	
6-10	35.0 (8.6)	
>10	30.0 (6.9)	
Educational attainment (years)		
<1	30.0(5.8)	0.0003
1-6	35.7(7.3)	
7-12	36.1(12.6)	
>12	42.2(11.2)	

Discussion

The perception of insulin is poor among insulin naïve persons compared to those on insulin. This is similar to what was found in Taiwan in a study by Chen and his colleagues[14] and Snoek et al[13] in Netherlands. In the USA, Peyrot and colleagues[4] also found that patients' resistance to insulin is substantial. This may mean that insulin naïve persons are not well educated about the use of insulin as a treatment option for type 2 diabetes mellitus. It may also mean that persons on insulin have some 'experience' with insulin use thereby giving a better perception.

The study also found that the average of most questions marked as agree or strongly agree between insulin naïve persons and persons on insulin was significantly different except for questions relating to commencement of insulin (taking insulin means I have failed to manage my diabetes with diet and tablets),

insulin causing weight gain and the concerns of their family and friends in relation to insulin use.

This is not in keeping with what Chen and his colleagues[14] found in Taiwan. The finding in this study that taking insulin means I have failed to manage my diabetes with diet and tablets may mean that continuous diabetes education about insulin use is inadequate in our setting. The doctors in our centre have little time for diabetes education during consultation as they have many patients and no trained diabetes educator. A study conducted among patients with poor glycaemic control in Turkey found that lack of adequate information relating to insulin appears to be the major factor behind patients' refusal of insulin treatment[15]

There was also no statistical difference between the two groups concerning insulin as a cause of weight gain in this study. It is true that many patients who begin insulin gain weight[16] but this is dependent on baseline body mass index, HbA1c, insulin regimen, insulin dose, other glucose lowering agents and hypertension[17]. Weight gain may have been the experience of persons on insulin and the observation of insulin naïve persons which may have necessitated the response in this study.

Ours is an environment of close family ties and family members are usually concerned about each other but in this study only a little over 50% of patients on insulin believe that their family members are concerned about them because of insulin use and 48% of insulin naïve persons feel the same. This was not the findings in a study in Taiwan by Chen and colleagues[14]. This may mean that the family members see insulin as a drug and treatment option for type 2 diabetes mellitus and so are not worried about it.

This study found no relationship between gender, duration of diabetes, duration on insulin and age and the perception of insulin among persons on insulin. However, persons with higher levels of education have higher negative appraisal than those without much education. Chen and colleagues found the same in Taiwan[14]. This may be surprising as we expect that people with more education to have a better perception of insulin. This however may suggest that diabetes education is different from the general education people receive and so assumption should not be made when educating people with diabetes mellitus.

This study had some limitations including the lack of translation of the instrument used (ITAS) to the indigenous languages. The better perception among persons on insulin may be as a result of some experience and observations which may have made them have an optimistic attitude to insulin. Additionally, it is a hospital based study, so it may not be generalized to all patients with type 2 diabetes mellitus.

Conclusion

This study found that insulin naïve patients have a more negative perception of insulin use compared with patients on insulin. There was however no relationship between the perception of insulin and sex, duration of insulin use and age of the patients among patients on insulin. Patients with higher level of education have a poorer perception of insulin. Hence, educating patients with diabetes at the point of diagnosis and subsequently about the disease and treatment options may be important in the management of this condition. Assumption should not be made on the basis of level of education that some need more diabetes education than others. Continuous diabetes education will help to improve the perception of insulin among these patients.

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