Barriers for Insulin Therapy Initiation among Type 2 Diabetic Patients Attending the Specialized Center for Endocrinology and Diabetes / Baghdad 2019

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ABSTRACT:

BACKGROUND:

The beginning of insulin therapy is a mutual decision between the health care provider and the patient. People with type 2 diabetes mellitus often have strongly negative attitudes toward insulin therapy. This refusal is often based on a range of patient concerns and misconceptions.

OBJECTIVE:

To determine the barriers for insulin therapy refusal among type 2 diabetic patient, and to find the association between socio-demographic characteristic and the barriers of refusal.

PATIENTS AND METHODS:

A cross sectional study was conducted during the period from first of March to 30th of June 2019 in the Specialized Center for Endocrinology and Diabetes in Al-Kindy Teaching Hospital in Baghdad/Al-Rusafa. .The study was conducted by using a convenient sampling method of 400 patients' withT2DM. A questionnaire form was used to collect demographic data, and appraisal of insulin therapy measured by Insulin Treatment Appraisal Scale (ITAS).

RESULTS:

Perceived loss of control/ life style adaptation and restriction were the first barrier to initiation of insulin therapy (70.6%), and the least barrier to start insulin was perceived lack of positive gain (43. 1%), also there is statistically less negative appraisal scores in patients aged 45-60 years, males, higher educational levels and '10-12 years' duration of illness, but no statistical difference in regards whether a family member or a friend used, or did not use insulin.

CONCLUSION:

Many misconceptions about the use of insulin therapy can be corrected by working to increase patient education.

KEYWORDS: insulin treatment, hypoglycemia, barriers.

INTRODUCTION:

Type 2 diabetes mellitus (T2DM) is characterized by deregulation of carbohydrate, lipid and protein metabolism, and results from impaired insulin secretion, insulin resistance or a combination of both. Of the three major types of diabetes, T2DM is far more common (accounting for more than 90% of all cases) than either type 1 diabetes mellitus (T1DM) or gestational diabetes mellitus (GDM) [1] . The main cause of T2DM is progressively impaired insulin secretion by pancreatic β-cells on a pre-existing insulin resistance in skeletal muscle, liver, and adipose tissue [2] .

Management of T2DM is complicated by multiple pathophysiological disturbances [3]. Achievement of durable glycemic control requires antidiabetic medications that reverse the pathophysiological defects that are present in T2DM, because no single medication reverses the multiple abnormalities, combination therapy has gained widespread acceptance and will continue to grow [4]. Normalization of HbA1c at the time of diagnosis results in improved long-term glycemic control [5, 6]. Insulin therapy is obligatory for individuals with diabetic ketoacidosis and it can be taken into consideration for all patients who remain symptomatic, loss of weight, continuously high blood glucose concentration in fasting state more than 7-8 mmol/L, postprandial more than 10-12 mmol/L despite another treatment. American diabetic association recommends combination injectable therapy initially in the setting of symptomatic hyperglycemia (polydipsia, polyuria), HbA1C >10% or RPG level> 300mg/dl(16.6.mmol/L). American association of endocrinology/ American college of endocrinology recommends initiation of insulin therapy with other OHA if the initial HbA1C >9% in symptomatic individual [7].

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1st of March to 30th of June 2019 using a questionnaire as direct interview

Insulin refusal.

Most patients with T2DM usually require insulin therapy within the first 10 years of diagnosis to prevent complications. Unfortunately, according to a cross-sectional study conducted in the Al-Ahsa region, most of the patients with T2DM (67%) who attend primary health care (PHC) have poor glycemic control (HbA1C ≥ 7%) [8]. Several suggested reasons may explain this issue one of them is delaying insulin initiation, although insulin is considered the best available treatment to achieve good glycemic goals [9]. In a UK study, 50% of T2DM patients delayed insulin initiation despite suboptimal control for 5 years, regardless of the presence of complications [10]. The prevalence of insulin refusal was estimated to be high in Singapore (70.6%) [11].

OBJECTIVE:

Determination of the barriers for insulin therapy refusal among T2DM patient and find the association between socio-demographic characteristic and the barriers of refusal.

METHODS:

A cross-sectional study using a convenient sample from in the Specialized Center for Endocrinology and Diabetes in AlKindy Teaching Hospital in Baghdad/Alrusafa. Data collection was carried out from

Exclusion criteria. Pregnant female with gestational diabetes.

Tools of data collection.

Part I: includes demographic data**.** Age, gender, level of education (illiterate, primary, secondary, and higher education), duration of diabetes, and family member or friend uses insulin**.**

Part II: includes tool to measure insulin refusal

a. Appraisal of insulin therapy was measured by (ITAS).

ITAS a 20-item questionnaire including 16 statements pointing to barriers to insulin use and four pointing to its benefits, this ITAS was developed and validated for use by people with T2DM despite of current treatment type, with the benefits of enabling assessment both before and after insulin initiation [12].

The ITAS contains 20 statements regarding common beliefs and attitudes related to insulin therapy in which subject's rate their agreement with each statement using a five point. Likert scale (1 = strongly disagree) to (5 = strongly agree)). Four of these statements are positively worded and reverse scored before totaling and 16 are negatively worded [12].

Moreover, higher ITAS scores (indicating more negative appraisal of insulin) are associated with being hypothetically less 'willing' to begin insulin if prescribed [13] .

Items representing a negative attitude towards insulin therapy Q1 (Taking insulin means I have failed to manage my diabetes with diet and tablets. Q2 (Taking insulin means my diabetes has become much worse). Q4 (Taking insulin means other people see me as a sicker person. Q5 (Taking insulin makes life less flexible). Q6 (I am afraid of injecting myself with a needle). Q7 (Taking insulin increases the risk of low blood glucose levels hypoglycemia). Q9 (Insulin causes weight gain). Q10 (Managing insulin injections takes a lot of time and energy).Q11 (Taking insulin means I have to give up activities I enjoy). Q12 (Taking insulin means my health will deteriorate). Q13 (Injecting insulin is embarrassing). Q14 (Injecting insulin is painful).Q15 (It is difficult to inject the right amount of insulin correctly at the right time every day). Q16 (Taking insulin makes it more difficult to fulfill my responsibilities at work, or at home). Q1 8(Being on insulin causes family and friends to be more concerned about me). Q20 (Taking insulin makes me more dependent on my doctor).

Items representing a positive attitude towards insulin therapy Q3-Taking insulin helps to prevent complications of diabetes.Q8-Taking insulin helps to improve my health. Q17-Taking insulin helps to maintain good control of blood glucose. Q19-Taking insulin helps to improve my energy level.

For proper statistical analysis we merge strongly disagree and disagree in one column (disagree) and strongly agree with agree to become one column (agree).

b. Psychosocial dimensions of insulin refusal will be measured by selected questions from (ITAS) under six domains

1- Perceived personal blame, Q (1 & 2)
2- Fear of injection, Q (6&14)
3- Fear of side effects/complications, Q (7, 9, and12).
4- Self-pity/ social stigma, Q (4, 13, and 18)
5- Perceived loss of control / Lifestyle adaptations and restrictions (Q5, 10, 11, 15, 16, and20).
6- Perceived lack of positive gain, Q (3, 8, 17, and 19)

For calculation of each domain of ITAS we measured the percentages of agreement with that domain if negative (domain 1-5) and percentages of disagreement with that domain if positive (domain 6) (14).

Ethical Consideration.

Verbal consent of each interviewed person was approved after full explanation of the aim of the study and ensuring the confidentiality of the collected data that was not used but for the research purposes.

Statistical Analysis. Microsoft excel was used to inter the collecting data which then be loaded into statistical package for the social science version 23 (SPSS 23) was used for both data entry and data analysis. Descriptive statistics presented as (mean ± SD), frequencies, and percentages. Chi–square test was used in inferential statistics to find out significance of related variables. P-value of < 0.05 was considered significant.

RESULTS:

Table 1: Distribution of studied sample according to socio-demographic characteristics, no. = 400.

Variables		Frequency No.=400	Percentage %
Age in years	<45	112	28.0
	45-60	196	49.0
	>60	92	23.0
Gender	Male	176	44.0
	Female	224	56.0
Education	Illiterate	110	27.5
	Primary	116	29.0
	Secondary	132	33.0
	Higher	42	10.5
Duration of T2DM in years	<10	242	60.5
	10-20	114	28.5
	>20	44	11.0
family member or friend uses insulin	Yes	106	26.5
	No	294	73.5

Table 2: Distribution of respondents according to responses to individual items of the questionnaire.

	Items	Disagree (%)	Neutral (%)	Agree (%)
1	Taking insulin means I have failed to manage my diabetes with diet and tablets	55	0	45
2	Taking insulin means my diabetes has become much worse	49.5	0.5	50
3	Taking insulin helps to prevent complications of diabetes	54.5	2	43.5
4	Taking insulin means other people see me as a sicker person	50	0	50
5	Taking insulin makes life less flexible	24.5	0.5	75
6	I'm afraid of injecting myself with a needle	25	0	75
7	Taking insulin increases the risk of low blood glucose levels (hypoglycemia)	36.5	0	63.5
8	Taking insulin helps to improve my health	43.5	14.5	42
9	Insulin causes weight gain	64	1	35
10	Managing insulin injections takes a lot of time and energy	16	1.5	82.5
11	Taking insulin means I have to give up activities I enjoy	25.5	3.5	71
12	Taking insulin means my health will deteriorate	60	7.5	32.5
13	Injecting insulin is embarrassing	58	0	42
14	Injecting insulin is painful	54	0	46
15	It is difficult to inject the right amount of insulin correctly at the right time every day	42	1.5	56.5
16	Taking insulin makes it more difficult to fulfill my responsibilities (at work, at home)	24	6	70
17	Taking insulin helps to maintain good control of blood glucose	46	19.5	34.5
18	Being on insulin causes family and friends to be more concerned about me	42	1.5	56.5
19	Taking insulin helps to improve my energy level	18	29.5	52.5
20	Taking insulin makes me more dependent on my doctor	30.5	0.5	69

Table 3: Distribution of total ITAS score of studied samples according to age group.

	No.	Mean of score	Std. Deviation	P value
<45 Year	112	64.87	8.29	0.001
45-60 Year	196	61.48	7.43	
>60 Year	92	63.21	7.90	

Table 4: Distribution of total ITAS score of studied samples according to gender.

Gender	No.	Mean of score	Std. Deviation	P value
Male	176	60.67	8.13	0.001
Female	224	64.53	7.30	

Table 5: Distribution of total ITAS score of studied samples according to educational level.

Educational level	No.	Mean of score	Std. Deviation	P value
Illiterate	110	62.89	7.54	0.014
Primary	116	64.36	8.14	
Secondary	132	62.37	8.10	
Higher	42	59.90	6.69	

Table 6: Distribution of total ITAS score of studied sample according to duration of disease.

Duration of disease	No.	Mean of score	Std. Deviation	P value
<10Year	242	63.71	8.52	0.020
10-20Year	114	61.28	7.73	
>20 Year	44	62.04	6.85	
Total	400	62.83	8.39	

Table 7: Distribution of total ITAS score of studied sample according to family member or friend uses insulin.

Family member or friend uses insulin	No.	Mean of score percentage %	Std. Deviation	P value
Yes	106	62.45	7.31	0.543
No	294	62.97	8.11	

Table 8: Distribution according to domains of psychosocial insulin resistant.

Factors influencing insulin refusal domains		Questions of ITAS	Mean Score
1	Perceived personal blame	1&2	47.5
2	Fear of injection	6&14	60.5
3	Fear of side effect and complication	7,9&12	43.6
4	Self-pity / social stigma	4,13&18	49.5
5	Perceived loss of control/ life style adaptation and restriction	5,10,11,15,16 &20	70.6
6	Perceived lack of positive gain	3,8,17&19	43.1

DISCUSSION:

Socio- demographic

1. Age.There is statistically lower negative appraisal score in patients aged 45-60 years in this study. While in a study was done by Taylor et al (2016) in Australia, he reported that ITAS scores were lower (better) in ≤49 years [15].

2. Gender. There are statistically lower negative appraisal scores in males in this study. this agree with a study done by Saleem et al (2016) in Pakistan revealed that better scores (they used reversed scoring so that higher score meant positive behavior) were observed in males [16].

3. Education**.** In this study, there is statistically lower negative appraisal scores in higher educational levels. this agree with a study done by Maha et al in Egypt who found highly significant statistical difference regarding the level of education of patients, with positive appraisal scores in higher educational levels [(17)].

4. Duration of diabetes. In the current study, there is statistically lower negative appraisal scores in patients who have 10-12 years' duration of illness. In a study done by Saleem et al (2016) in Pakistan revealed that better scores (they used reversed scoring so that higher score meant positive behavior) were observed in those who were willing to use insulin [(16)].

5. Family member or a friend use insulin. In this study, there is no statistical difference in regards whether a family member or a friend used, or did not use insulin. Ali and Abdul Raheem (2015) in Baghdad who found that the participants with family members or friends who used insulin had lower score did a study [(18)].

Psychosocial dimensions:

1. Perceived personal blame (PPB). In the current study, the PPB in less than half of the study population, as 45% of them agreed with statement one "Taking insulin means I have failed to manage my diabetes with diet and tablets in addition, half of the studied sample agreed with statement two: "Taking insulin means my diabetes has become much worse". These figures were slightly better compared to results of Abdulkader (2017) in Duhok, who studied 162 T2DM patients, and reported that 85.55% were unwilling to start insulin therapy [(19)].

2. Fear of injection. In the current study, fear of injection was the second most common barrier, as less than half agreed with statement "I'm afraid of injecting myself with a needle", and to the statement "Injecting insulin is painful". Another study was done Mostafavian et al (2018) in Iran, who studied 110 T2DM patients who refused insulin, and reported that 78.2% agreed that insulin injection is painful, did and 74.5% agreed that self-needle injections were painful [(20)].

3. Fear of side effect and complication. In this study, nearly half of the studied sample reported that they refused insulin therapy due to fear of side effects and complications, as more than half of patients agreed that insulin increase the risk for hypoglycemia believed it causes weight gain and one third thought it causes health deterioration. This agreed with Batais and Schantter (2016) in Saudi Arabia, who studied 408 T2DM patients not on insulin, and reported that 45.1% of the patients fear of hypoglycemia, and 40.7% think that it will cause weight gain [(21)].

4. Self-pity/ social stigma. In the current study, half of the studied sample had self-pity/ social stigma, as half of patients though that injecting insulin makes other people see them as a sicker person with, 42% believed that injecting insulin is embarrassing, and 56.5% agreed to statement "that being on insulin causes family and friends to be more concerned about me". This was lower than the results of Bayoumy and Dawood (2018) in Kuwait, who studied 200 T2DM patients, and reported that 51.8% fear social stigma, and 64.5% thought insulin injection is embarrassing [(22)].

5. Perceived loss of control/ life style adaptation and restriction. In the current study, this domain was the predominant barrier to insulin, as 70.6% of patients perceived it. As compared to the results of Ali and AbdulRaheem (2015) in Baghdad, reported fear of injection to be the predominant barrier(71%) while the perceived loss of control was the lowest barrier (38.6%), as 39% only agreed that insulin decrease life flexibility, 22% only thought it limits enjoyable life activities, 33% agreed that insulin makes it more difficult to fulfill their responsibilities and close to the results of the current study as 62% agreed that insulin makes them more dependent upon their doctors.

Regarding insulin usage 40.0% agreed that its injections takes a lot of time and energy, 36% agreed that it is difficult to inject the right amount of insulin correctly at the right time

every day [(18)]. Since both studies were carried out in the same centers, this might indicate that perceptions of patients change with time, even in the same community in addition insulin will add another burden, which will accompany the already existing stress, lifestyle restrictions related to diabetes treatment

6. Perceived lack of positive gain**.** In a study in Baghdad by Mohamed huseein found that, patients believe in lack of benefit from starting insulin treatment is (62.2%) [(14)]. In the current study, less than half of studied sample had perceived lack of positive gain, as 43.5% agreed to statement "Taking insulin helps to prevent complications of diabetes", 42% agreed to statement "Taking insulin helps to improve my health", 34.5% agreed to

statement "Taking insulin helps to maintain good control of blood glucose" and 52.5% agreed to statement "Taking insulin helps to improve my energy level.

Limitations of study: In cooperation of some patients during data collection.

CONCLUSION:

1. Most patient reported a predominantly Perceived loss of control/ life style restriction as a barrier to initiation of insulin therapy, fear of injection was the second most common barrier. The least barrier to start insulin was Perceived lack of positive gain.
2. Patients with higher education, male, aged (45-60) years, and patients with disease duration (10-20 years) had low negative appraisal of insulin therapy.

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