PSYCHOLOGICAL BARRIERS TOWARDS EARLY INSULIN INITIATION IN UNCONTROLLED TYPE 2 DIABETIC PATIENTS

Naveed Iqbal1, Zafar Ali2, Inayat Ullah3, Ziauddin4, Muhammad Bilal Awan5, Khalid Mahmood6

ABSTRACT

Objective: To determine the frequency of patients’ related psychological factors that delay timely insulin initiation in uncontrolled type 2 diabetic patients presenting to a teaching hospital.

Methodology: This was a descriptive study performed in Lady Reading Hospital, Medical Teaching Institution, Peshawar from February 2017 to February 2018. Three hundred patients of type 2 Diabetes who had not achieved target HbA1c were enrolled in the study by simple random sampling. A questionnaire was filled for each patient, after consent, including their age, sex and occupation, duration of diabetes, HbA1c level, current medications and reasons for insulin refusal. SPSS version 20 was used for data interpretation.

Results: Three hundred patients [168 (54%) female and 132 (46%) male] were included in the study. Requirement of healthcare personnel to inject insulin (91.33%) followed by fear of injection (85.33%), fear of hypoglycemia (84%), insulin therapy being lifelong (84%) and injections being painful (80.66%) were the most reported concerns. Insulin injections being embarrassing (41.33%), vision problem (42.66%) and fear of weight gain (44.66%) were the least reported concerns of the patients.

Conclusion: A number of important psychological barriers leading to refusal of early insulin initiation in uncontrolled type 2 diabetic patients were found in this study. Requirement of healthcare personnel to inject insulin was found to be the most frequent psychological barrier followed by fear of injection, fear of hypoglycemia, lifelong insulin therapy and injections being painful.

Key Words: Type 2 diabetes, Insulin, Psychological barriers, Hypoglycemia

INTRODUCTION

Diabetes is a progressive disease and its management is complicated with time as the beta cells are progressively diminished. Oral hypoglycemic agents are then frequently not sufficient to control glycomic status and insulin therapy is required. It has been shown that more than half of the newly diagnosed diabetic patients are not able to achieve target HbA1c and require insulin therapy within 6 years of diagnosis1,2. Many landmark lineal and epidemiological studies have shown reduced incidence of microvascular and macrovascular complications in intensively controlled diabetic patients3-5.

As poorly controlled type 2 diabetics are more prone to long term complications of diabetes mellitus, early use of insulin has been recommended to prevent long term complications of diabetes6. About fifty percent of diabetic patients with poorly controlled glycomic status do not start their insulin therapy timely and there is usually a delay of three to five years after failure of oral hypoglycemic agents7,8. A study carried out in USA showed that 33% of type 2 diabetics who were poorly controlled refuse to start insulin therapy8. Another study conducted in Bangladesh showed that 42.5% patients with poorly controlled type 2 diabetes were unwilling to start insulin therapy initially with 20.3% refusing insulin use even after repeated counselling9. Similarly, an Egyptian study reported insulin refusal in 40% of uncontrolled diabetic patients10.

There are many factors which influence delayed insulin initiation including those related to health system and health care providers as well as the patients themselves11,12. One of the main barrier is psychological insulin resistance (PIR), defined as psychological opposition towards insulin use among patients as well as health care providers12,14. The clinician can play a vital role in the timely introduction of insulin and majority of PIR cases can be prevented through effective health educa-
tion. If clinicians began to introduce the possible use of insulin early in the treatment and help patients see insulin as a friend rather than enemy many PIR cases can be prevented\(^\text{10}\). The aim of this study was to determine the frequency and reasons for insulin refusal among patients with uncontrolled type 2 diabetes coming to out patient’s department and admitted in medical units of Lady Reading Hospital, Peshawar.

**METHODOLOGY**

This was a descriptive study performed in out-patient’s department and medical units of Lady Reading Hospital, Medical Teaching Institution, Peshawar from February 2017 to February 2018. The data were collected prospectively. Three hundred patients of type 2 diabetes who were not achieving target HbA1c and who were willing to answer the question given in the questionnaire were enrolled in the study by simple random sampling. Sample size was calculated keeping 42.5% of poorly controlled type 2 diabetics who refuse to start insulin therapy\(^\text{10}\), at 95% confidence interval and 5.6% margin of error using WHO sample size software. The study was conducted after the approval of the hospital ethical review board. The purpose of research was explained and informed consent was taken from every patient. Those who were unwilling to participate in the study or suffering from psychiatric illnesses were excluded.

A questionnaire was filled for each patient including their age, gender, occupation, duration of diabetes, HbA1c level, current medications and reason for insulin refusal. Target HbA1c was defined as <7%. The 12 categories of psychological barriers towards early insulin initiation in uncontrolled diabetics patients were recorded as: the injection being painful, require healthcare personnel assistance, is embarrassing, restrict life style of the patient, causes organ damage, is used in severe diabetics, is life long, there is a fear of hypoglycemia, is costly, there is vision problem on part of the patient, there is a fear of injection and a fear of weight gain. Keeping in mind the educational status of patients in this study, they were made understand in their native language by the researchers and then their responses were recorded. The patient had to respond whether he or she agrees, disagrees or don’t know about a particular reason for insulin refusal.

All the above mentioned information was recorded in a pre-designed proforma. The data were entered, stored and analyzed by SPSS version 23. Mean ±SD was calculated for numerical variables like age and serum HbA1c levels. Frequencies and percentages were calculated for categorical variables like gender, educational status, occupation and psychological barriers towards early insulin initiation. Psychological barriers were stratified among age and gender to see the effect modifications. Tables and figures were used to present the data.

**RESULTS**

Total number of patients were 300 of whom 168 (54%) were female and 132 (46%) were male. Female to male ratio was 1:1.27. The minimum age of the patients was 35 years and maximum was 80 years and mean age was 59.31 ±7.42 years.

The mean HbA1c level was 8.79% ±2.6% (range 6.5%-10.95%). Patients were divided into four groups according to their duration of diabetes as illustrated in Table 1. Most of the patients belonged to the group having duration of diabetes of 6 to 10 years and least patients in the group with duration of diabetes of 15 years and more.

Educational status of patients is illustrated in Figure 1 with majority of the patients being uneducated (40.33%). The occupational status of patients is illustrated in Table 2. Most of the patients were female house wives (37.3%) followed by teachers (12%) and farmers (10%).

Requirement of healthcare personnel to inject insulin stands out to be the most important psychological barrier towards early insulin initiation agreed by most of the patients in this study (91.33%) followed by fear of injection (85.33%), fear of hypoglycemia (84%), insulin therapy being lifelong (84%) and injections being painful (80.66%); as shown in Table 3.

<table>
<thead>
<tr>
<th>Duration of Diabetes (Years)</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;5</td>
<td>20</td>
<td>06.7%</td>
</tr>
<tr>
<td>6-10</td>
<td>220</td>
<td>73.33%</td>
</tr>
<tr>
<td>11-15</td>
<td>56</td>
<td>18.7%</td>
</tr>
<tr>
<td>&gt;15</td>
<td>04</td>
<td>01.33%</td>
</tr>
<tr>
<td>Total</td>
<td>300</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 1: Age groups according to duration of diabetes (n=300)
Table 2: Occupational status of patients (n=300)

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>House Wives</td>
<td>112</td>
<td>37.3%</td>
</tr>
<tr>
<td>Teacher</td>
<td>36</td>
<td>12%</td>
</tr>
<tr>
<td>Farmer</td>
<td>30</td>
<td>10%</td>
</tr>
<tr>
<td>Businessman</td>
<td>22</td>
<td>7.3%</td>
</tr>
<tr>
<td>Health Worker</td>
<td>18</td>
<td>06%</td>
</tr>
<tr>
<td>Clerk</td>
<td>18</td>
<td>06%</td>
</tr>
<tr>
<td>Shop Keeper</td>
<td>16</td>
<td>5.3%</td>
</tr>
<tr>
<td>Laborers</td>
<td>12</td>
<td>04%</td>
</tr>
<tr>
<td>Retired from Service</td>
<td>12</td>
<td>04%</td>
</tr>
<tr>
<td>Others</td>
<td>24</td>
<td>08%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>300</td>
<td>100%</td>
</tr>
</tbody>
</table>

Table 3: Psychological barriers towards early insulin initiation (n=300)

<table>
<thead>
<tr>
<th>Psychological Barriers</th>
<th>Agree</th>
<th>Do Not Agree</th>
<th>Do Not Know</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injection Being Painfull</td>
<td>242 (80.66%)</td>
<td>14 (04.67%)</td>
<td>44 (14.67%)</td>
</tr>
<tr>
<td>Require Healthcare Personnel Assistance</td>
<td>274 (91.33%)</td>
<td>14 (04.66%)</td>
<td>12 (04%)</td>
</tr>
<tr>
<td>Injection is Embarassing</td>
<td>124 (41.33%)</td>
<td>100 (33.33%)</td>
<td>76 (25.33%)</td>
</tr>
<tr>
<td>Restrict Life Style of the Patient</td>
<td>234 (78%)</td>
<td>16 (05.33%)</td>
<td>50 (16.67%)</td>
</tr>
<tr>
<td>Causes Organ Damamage</td>
<td>172 (57.33%)</td>
<td>52 (17.33%)</td>
<td>76 (25.33%)</td>
</tr>
<tr>
<td>Injection is Used in Severe Dibetes</td>
<td>240 (80%)</td>
<td>06 (02%)</td>
<td>54 (18%)</td>
</tr>
<tr>
<td>Injection is given Life Long</td>
<td>252 (84%)</td>
<td>08 (02.66%)</td>
<td>40 (13.33%)</td>
</tr>
<tr>
<td>Injection is Costly</td>
<td>200 (66.67%)</td>
<td>44 (14.66%)</td>
<td>56 (18.67%)</td>
</tr>
<tr>
<td>Fear of Hypoglycemia</td>
<td>252 (84%)</td>
<td>08 (02.66%)</td>
<td>40 (13.33%)</td>
</tr>
<tr>
<td>Perception of Vision Problem with Injection</td>
<td>128 (42.66%)</td>
<td>150 (50%)</td>
<td>22 (07.33%)</td>
</tr>
<tr>
<td>Fear of Injection</td>
<td>256 (85.33%)</td>
<td>14 (04.66%)</td>
<td>30 (10%)</td>
</tr>
<tr>
<td>Fear of Weight Gain</td>
<td>134 (44.66%)</td>
<td>88 (29.33%)</td>
<td>78 (26%)</td>
</tr>
</tbody>
</table>

Figure 1: Educational status of patients (n=300)
The delay in initiation of insulin in uncontrolled type 2 diabetic patients can be multifactorial including factors related to the health care system, health care providers or the patients itself. Effective strategies are needed to overcome psychological insulin resistance. The current study provides an insight into the psychological barriers towards early initiation of insulin on part of the patients.

Injection related factors such as injection requiring assistance of a health care personnel (91.33%), fear of injection (85.33%) and injections being painful (80.66%) stand out to be the most important factors on part of the patients for delayed insulin initiation in our study. Khan et al. in Rawalpindi and Ahmad et al. in Agha Khan University Karachi, found almost similar factors in their studies. Similar results were also reported in other regional and international studies. The anxiety of self-injection, related to apprehension regarding proper injection technique and concern about correct dose preparation, was found to be amongst the largest barriers to insulin therapy (54.1%)\(^9\). The insulin injection was less traumatic actually than initially anticipated by the patient so once the patients start getting insulin, the fear of injection would diminish with time\(^9\). Requiring assistance and life style modification was also a documented factor found in international studies in more than 50% of cases. In the study by Gulam et al. insulin injections were perceived as painful by 44.3% and injection phobia was reported in 33.5% of patients. Jha et al. has shown fear of injection and fear of hypoglycemia as major factors for PIR. As most of misconception and fear is related to the insulin injection, effective health education and counselling of type 2 diabetic patients right from the diagnosis and the emphasis on the use of insulin at some stage of their treatment can help a lot to reduce refusal of insulin when it is needed in glycemic control. Patients can be reassured that insulin injection is not that painful as they think because currently used insulin ultrafine needles are associated with less pain. Moreover, use of insulin pens can be helpful because they are easy to use by the patients, less painful and allow more flexibility in daily life works\(^11\).\(^{13}\).

The other important factor that insulin injection require health care provider assistance can also be alleviated by effective education and teaching the patient the technique of self-injection. Once the patient inject insulin with proper technique in front of a healthcare provider the fear of self-injection and pain is reduced in most of the patients. If the patient has a vision problem or is incapacitated by another disease, the relatives can be taught the injection technique.

Factors such as Insulin injections being embarrassing (41.33%), vision problem (42.66%) and fear of weight gain (44.66%) were the least reported concerns of the patients in this study. This was in contrast to the studies done in other countries in which these factors were also important psychological barriers towards early insulin initiation in uncontrolled type 2 diabetes. This might be because most patients, especially the female, were uneducated so their concerns were different as compared to the patients of well developed countries.

### LIMITATIONS

Limitations of the study were that it was not a community based study and only patients presenting to outpatient’s department and admitted in medical units of Lady Reading Hospital, Peshawar were included in the study; so the results cannot be generalized to the general population. However, our study still reflected the major psychological barriers towards early insulin initiation in uncontrolled type 2 diabetes with fair confidence because patients come to this hospital from all areas of the Khyber Pakhtunkhwa province of Pakistan.

### CONCLUSION

A number of important psychological barriers leading to refusal of early insulin initiation in uncontrolled type 2 diabetic patients were found in this study. Requirement of healthcare personnel to inject insulin was found to be the most frequent psychological barrier followed by fear of injection, fear of hypoglycemia, lifelong insulin therapy and injections being painful.

### RECOMMENDATIONS

Psychological barriers and many misconceptions on part of the uncontrolled type 2 diabetic patients are important factors in delayed initiation of insulin in these patients which lead to considerable morbidity and long term complications of diabetes in these patients. Proper health education including the emphasis on the need of insulin therapy at some stage of the disease can play an important role in removing most of these psychological barriers. A good relationship between patients and healthcare providers is also of key importance.

### REFERENCES


PSYCHOLOGICAL BARRIERS TOWARDS EARLY INSULIN INITIATION IN UNCONTROLLED TYPE 2 DIABETIC PATIENTS


27. Polonsky WH, Fisher L, Guzman S, Villa-Caballero L, Edelman SV. Psychological insulin resistance in patients with type 2 diabetes: the scope of the prob-
PSYCHOLOGICAL BARRIERS TOWARDS EARLY INSULIN INITIATION IN UNCONTROLLED TYPE 2 DIABETIC PATIENTS


CONTRIBUTORS
NI conceived the idea, planned the study and drafted the manuscript. ZA, IU, Z, MBA and KM helped acquisition of data, did statistical analysis and critically revised the manuscript. All authors contributed significantly to the submitted manuscript.