Perception of Insulin Therapy in Patients with Type 2 Diabetes Mellitus in a Primary Care Center in Singapore

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ABSTRACT

This was a single-centre, cross-sectional, interviewer-administered survey study conducted in order to better understand the perception of Insulin among patients with Type 2 Diabetes Mellitus (T2DM) in Singapore. A 25-question survey, adapted from the Insulin Appraisal Treatment Scale (ITAS) was used to interview 70 patients from the Polyclinic. Patients of Indian ethnicity, with more than eight years of Diabetes history, less than 45 years of age, with higher educational background, and Hb1Ac greater than 7.0% had less negative appraisal for Insulin. In addition, Insulin naïve patients had a more negative appraisal for Insulin compared to Insulin treated patients. Many Insulin naïve patients associated Insulin with disease progression, fear of injections, and inflexible lifestyle; negative appraisals were also reported in Insulin-related adverse effects, and social stigma. In conclusion, healthcare professionals may wish to focus on groups who are more prone to perceive Insulin negatively when counseling patients, and emphasize on perceptions that worry Insulin naive and Insulin treated patients the most.

INTRODUCTION

The implementation of Insulin in the management of Type 2 Diabetes Mellitus (T2DM) is often necessary for better glycemic control in patients who have optimized on, or are intolerant to their oral antidiabetic therapy. In certain group of patients, early initiation of Insulin may prevent future complications from arising\(^1\). The term Psychological Insulin Resistance (PIR) is often used to describe those who refuse or delay the initiation of Insulin. This study aims to understand the PIR among patients with T2DM in Singapore by comparing the PIR among Insulin naïve and Insulin treated patients, between different social demographic groups and their clinical history.

METHODOLOGY

This was a single-centre, cross-sectional, interview-administered survey study approved by the NHGP Domain Specific Review Board (DSRB). A 25-question survey,
adapted from the Insulin Appraisal Treatment Scale (ITAS) was used to interview 70 patients from the Polyclinic. The inclusion criteria were patients diagnosed with T2DM, aged between 21 and 69, and able to converse in English, Mandarin or Malay without assistance.

SURVEY FINDINGS

Social Demographics and Clinical History
Discrete analysis revealed less negative appraisal scores for Insulin with the following groups of patients: less than 45 years of age, Indian ethnicity, higher educational background, more than 8 years of T2DM history, and Hb1Ac greater than 7.0%.

Initiation of Insulin
Of 70 patients, 25 (35.7%) patients agreed and 8 (11.4%) patients strongly agreed to initiate Insulin. Of these 33 patients, 19 (34.5%) were Insulin naïve while the rest (93.3%) were Insulin treated patients.

Perception of Insulin
Table 1 lists the mean appraisal scores by category between Insulin naïve and Insulin treated patients. Except for Category 2, a higher mean appraisal score by category indicates a more negative appraisal for Insulin, with each score ranging between 1 and 5. In this study, the total mean appraisal score indicated that Insulin naïve patients had a more negative appraisal for Insulin compared to Insulin treated patients (67.7% and 58.8%, respectively).

Perception of Disease Progression (3.64), Perception of Injection (3.50), and Perception of Therapy (3.40) were the main PIR for Insulin naïve patients. For Insulin treated patients, the main PIR were Perception of Insulin-related Adverse Effects (3.21), Perception of Disease Progression (3.07), and Perception of Social Stigma (2.80).

Table 1: Mean Appraisal Scores by Category between Insulin Naïve and Insulin Treated Patients

<table>
<thead>
<tr>
<th>Categories</th>
<th>Mean</th>
<th></th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Insulin Naïve</td>
<td>Insulin Treated</td>
</tr>
<tr>
<td>1. Perception of Disease Progression</td>
<td>3.64</td>
<td>3.07</td>
</tr>
<tr>
<td>2. Perception of Diabetes Control</td>
<td>3.95</td>
<td>4.10</td>
</tr>
<tr>
<td>3. Perception of Injection</td>
<td>3.50</td>
<td>2.47</td>
</tr>
<tr>
<td>4. Perception of Lifestyle Modification</td>
<td>3.33</td>
<td>2.60</td>
</tr>
<tr>
<td>5. Perception of Insulin-related Adverse Effects</td>
<td>3.17</td>
<td>3.21</td>
</tr>
<tr>
<td>6. Perception of Social Stigma</td>
<td>3.35</td>
<td>2.80</td>
</tr>
<tr>
<td>7. Perception of Therapy</td>
<td>3.40</td>
<td>2.56</td>
</tr>
<tr>
<td>Percentage Total Mean Appraisal Scores (%)</td>
<td>67.7</td>
<td>58.8</td>
</tr>
</tbody>
</table>

Perception of Disease Progression
More Insulin naïve patients perceived that Insulin is initiated when their disease has worsened. Forty-two patients (76.4%) agreed or strongly agreed that using Insulin means that their diabetes have worsened, while 43 (78.1%) felt
that using Insulin means they failed to properly care for their diabetes previously. Eight (53.3%) Insulin treated patients agreed or strongly agreed to both statements.

Perception of Diabetes Control  More Insulin treated patients had less negative appraisal for diabetes control. Twelve patients (80.0%) agreed or strongly agreed that Insulin can *improve their health*, while all felt that it can *improve their diabetes control*.

Perception of Injection  More Insulin naïve patients believed that they will *not be able to inject Insulin correctly* as compared to Insulin treated patients (61.9% as compared to 20.0%). Thirty-four Insulin naïve patients (61.9%) *feared for needle injections*, while 6 Insulin treated patients (40.0%) felt the same.

Perception of Lifestyle Modification  More Insulin naïve patients agreed or strongly agreed to the statements presented in this category, except for the statement on *allowance for a less restrictive diet*. The statements include *inflexible lifestyle* (78.2% as compared to 40.0%), and *difficulty in fulfilling responsibilities* (67.3% as compared to 20.0%).

Perception of Insulin-related Adverse Effects  More Insulin treated patients agreed or strongly agreed that *Insulin will cause weight gain* (46.6%) as compared to Insulin naïve patients (9.1%). More Insulin naïve patients also believed that *Insulin may cause more complications in the long term* as compared to Insulin treated patients (52.7% as compared to 20.0%).

Perception of Social Stigma  More Insulin naïve patients agreed or strongly agreed that *using Insulin gives others the impression that I am more seriously ill* as compared to Insulin treated patients (78.2% as compared to 53.3%)

Perception of Therapy  More Insulin naïve patients agreed or strongly agreed to *delay Insulin until absolutely needing it* (78.1% as compared to 20.0%). For the statement I’ve *done everything I’m supposed to; having to use Insulin is not fair*, 47.3% Insulin naïve patients agreed or strongly agreed, while 6.7% Insulin naïve patients felt so.

Hb1Ac

Patients not willing to initiate Insulin had a lower mean Hb1Ac (7.23%) as compared to patients willing to use Insulin (7.47%).

**DISCUSSION**

**Social Demographics**

Patients who are either below 45 years of age or with a higher education background perceived Insulin less negatively due to better understanding of the medication.

**Perception of Patients with Insulin**
**Insulin Naïve Patients**   Insulin naïve patients reported a more negative appraisal for Insulin as compared to Insulin treated patients even though there were many who believed in the efficacy of Insulin. In fact, there were some patients who were willing to initiate therapy when ordered by their physicians, despite the reservations. Patients may associate Insulin with *disease progression* as physicians only prescribe Insulin when glucose levels are unacceptable. Physicians may also scare patients with Insulin for compliance to current medication regimen. Insulin naïve patients thought insulin would cause *lifestyle inflexibility*. Many were concerned about traveling issues, while some perceived it as troublesome when eating out. The *fear for injections* was less negatively perceived as patients may be used to lab tests during regular check ups with physicians, or perform regular self-blood glucose monitoring at home.

**Insulin Treated Patients**   Insulin treated patients reported a more positive review for Insulin than the Insulin naïve counterparts. However, these patients have a more negative perception on *Insulin-related adverse effects*. These patients may have experienced adverse effects before, or have been warned by healthcare providers about them before. Weight gain may also be due to perceiving that Insulin allows for a *less restrictive diet*.

**Healthcare Providers**   Many patients claimed that they will adhere to any treatment regimen prescribed by the physician as they are the experts in T2DM management. Future studies involving the perception of healthcare providers towards Insulin may be necessary.

**Hb1Ac Levels**   Patients not willing to use Insulin have a lower Hb1Ac as compared to patients willing to use Insulin. A higher Hb1Ac indicates disease progression, and these patients may worry for their health and be receptive for Insulin. The negative perception for Insulin may be a motivating factor for patients with lower Hb1Ac to maintain a strict lifestyle.

The relationship between Insulin appraisal and ethnic Indians, and also year of diagnosis may be coincidental in this study. Upon further discrete data analysis, majority of patients from both groups have Hb1Ac more than 7.0%. Patients with higher Hb1Ac are more amenable to Insulin, as mentioned above. Hence, these patients in general have a less negative appraisal.

**CONCLUSION**

Patients with T2DM should be properly counseled on the usages and emphasize on the advantages of Insulin. Focus should be given to patients in groups that are more prone to negative perceptions, while main perceptions of Insulin among Insulin naïve and Insulin treated patients can be stressed more while counseling.

**REFERENCES**