Patient Perceptions of Non-insulin Injection Devices for Type 2 Diabetes

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INTRODUCTION
• A range of injectable medications other than insulin are now used to treat type 2 diabetes (T2D). The most commonly used non-insulin injectable medications for T2D are in the class of glucagon-like peptide-1 receptor agonists (GLP-1 RAs). These treatments are often recommended as part of combination therapy when oral medication alone does not result in sufficient glycemic control.
• GLP-1 RA can be effective in lowering HbA1c, fasting blood glucose, and body weight, with a low risk of hypoglycemia. The most commonly reported injectable adverse events are gastrointestinal side effects.12
• Despite similarities in efficacy and safety, GLP-1 RAs vary in their injection devices and related treatment attributes:
  - The injection devices differ in a number of ways, including ease-of-use, size, requirements for needle handling, and multiple versus single use
  - Some GLP-1 RAs are injected every day,4,7 while others are injected once weekly.12
  - Some GLP-1 RAs require the patient to mix the medication prior to injection,2,3 while others do not have these requirements.
• These differences in the injection device and injection process could impact patients’ quality of life and preference among treatments

RESULTS
• Therefore, this qualitative study was designed to understand patients’ experiences with non-insulin injection delivery systems

METHODS
Study Design
• This was a qualitative study of patients with type 2 diabetes receiving non-insulin injectable medication. Participants took part in one-on-one concept elicitation interviews conducted in the UK, and Germany. Interviews focused on experiences with devices used to administer non-insulin injectable medications. Currently, the only commercially available non-insulin injectable medications for patients in the antihyperglycemics class are the GLP-1 RAs and pramlintide

Participants
• To be eligible, participants were required to meet the following five criteria:
  1. Currently residing in the US, UK, or Germany;
  2. At least 18 years old;
  3. Diagnosed with type 2 diabetes by a recognized medical professional;
  4. One of the following three criteria:
     a. Currently receiving a GLP-1 RA (or pramlintide) for T2D (but not insulin)
     b. Discontinued treatment with a GLP-1 RA (or pramlintide) for T2D within the last 6 months
     c. Currently receiving both a GLP-1 RA (or pramlintide) and insulin for type 2 diabetes and
     d. Prove to have provided medication (e.g., a doctor’s note, the medication itself for in-person interviews; a photo for telephone interviews)

Procedure
• On-the-one interviews were conducted either in-person or via telephone, following a semi-structured discussion guide which was developed based on literature review and clinician interviews. The interview focused on patients’ perceptions and experiences of non-insulin injection devices associated with treatment for T2D. Additional questions related to insulin injection devices were included for patients currently using both a GLP-1 RA and insulin to treat their type 2 diabetes

Qualitative Analysis
• Audio recordings of each interview were transcribed, and the qualitative data was analyzed using ATLAS.ti software. Teams of professional, including those who conducted the English interviews, reviewed the qualitative data obtained during the discussions and identified key themes that described important concepts raised by the participants. A coding dictionary was developed based on the content of the interview guide and concepts that emerged during the interviews.

• During coding, words and phrases provided by participants were selected using the coding dictionary and grouped into key themes, attributes, concepts, and relationships

RESULTS
Sample Characteristics
• Qualitative interviews were conducted with 32 patients (Table 1)

Perceptions of Non-insulin Injection Features
• Participants reported liking and disliking a wide range of features of their injections and associated devices (Table 2). Table 2 shows what they would like to change about non-insulin injectable devices, the most common responses were characteristics of the needle (n=8), requirements for injection preparation (n=6), or the need for multiple device parts (n=6)

Table 1. Sample Characteristics
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>US</th>
<th>UK</th>
<th>Germany</th>
<th>Total Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>11</td>
<td>14</td>
<td>7</td>
<td>32</td>
</tr>
<tr>
<td>Mean Age (SD)</td>
<td>56.9 (11.4)</td>
<td>59.7 (14.0)</td>
<td>67.3 (4.5)</td>
<td>60.38 (12.0)</td>
</tr>
<tr>
<td>N (%) Female</td>
<td>7 (63.6%)</td>
<td>6 (42.9%)</td>
<td>3 (42.9%)</td>
<td>16 (50.0%)</td>
</tr>
</tbody>
</table>

Table 2. Positive and Negative Perceptions of Non-insulin Injection Devices

<table>
<thead>
<tr>
<th>Injection Feature</th>
<th>Device Characteristics</th>
<th>US Example Quotations</th>
<th>UK Example Quotations</th>
<th>Germany Example Quotations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injection site</td>
<td>It doesn't hurt to do it, you just stick it in and shoot it out</td>
<td>I think that is just good</td>
<td>I think that is just good</td>
<td>It's not a big deal</td>
</tr>
<tr>
<td>Injection frequency</td>
<td>I do not have to inject every day</td>
<td>I think that is just good</td>
<td>I think that is just good</td>
<td>It's not a big deal</td>
</tr>
<tr>
<td>Time requirements</td>
<td>24 Yea, it's very quick and easy</td>
<td>4 Well, I said it, it's time consuming</td>
<td>2 It's very accurate</td>
<td>7 that selected setting would be a lot more precise</td>
</tr>
<tr>
<td>Size</td>
<td>27 it's compact in size, can carry it in your pocket</td>
<td>4 Well, I said it, it's time consuming</td>
<td>2 It's very accurate</td>
<td>7 that selected setting would be a lot more precise</td>
</tr>
<tr>
<td>Injection site</td>
<td>I put it in my arm. Put it there. That was a little getting or</td>
<td>In your belly… I can put it in</td>
<td>I have the needles available. I think I don't have to</td>
<td>I would like to be once a day, but it is possible.</td>
</tr>
<tr>
<td>Design/ appearance</td>
<td>27 nobody like that, it is not easy to mix it</td>
<td>I have the needles available. I think I don't have to</td>
<td>I have the needles available. I think I don't have to</td>
<td>I would like to be once a day, but it is possible.</td>
</tr>
<tr>
<td>Storage</td>
<td>27 the box takes up little bit of room in 15 my refrigerator</td>
<td>I would rather it be a little smaller</td>
<td>I have the needles available. I think I don't have to</td>
<td>I would like to be once a day, but it is possible.</td>
</tr>
</tbody>
</table>

Table 2 (cont’d). Positive and Negative Perceptions of Non-insulin Injection Devices

<table>
<thead>
<tr>
<th>Injection Feature</th>
<th>Device Characteristics</th>
<th>Positive Features</th>
<th>Negative Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injection site</td>
<td>It doesn't hurt to do it, you just stick it in and shoot it out</td>
<td>When you are mixing them you have to be careful how you mix it, and you don't have to go through the stages of mixing it, and shaking the device, and making sure it is all diluted, it is a waste of time.</td>
<td></td>
</tr>
<tr>
<td>Injection frequency</td>
<td>I do not have to inject every day</td>
<td>I am [confident] because it is premeasured and all I have to do is put it in</td>
<td>I think I don't like the fact that after you mix it up, you now have to mix the needle of it, I feel everything should come together.</td>
</tr>
<tr>
<td>Time requirements</td>
<td>I am [confident] because: it is monitored and size of the injection</td>
<td>I would like to be once a day, but it is possible.</td>
<td>I don't know. But once I put it in it, I don't think about that, I wouldn't. I wouldn't think about it for the rest of the day.</td>
</tr>
</tbody>
</table>

CONCLUSIONS
• In this multi-country qualitative study, patients reported a wide range of injection device features and the degree of their importance varied by country, device, and individual patient.

References:
14. 15. AstraZeneca Pharmaceuticals; 2015; Wellingborough, UK; p. 6.