Increasing Use of Continuous Glucose Monitoring (CGM) Among Youth with Type 1 Diabetes (T1D): International Comparison of Youth from the T1D Exchange (T1DX) and the DPV Initiative

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Background / Purpose

- In previous analyses, only a small minority of youth with T1D in the T1DX and DPV registries were using continuous glucose monitoring (CGM).
- In recent years new generations of CGM have shown considerable improvements in accuracy and usability.
- In this analysis we assessed increase in CGM use over the past 6 years in the US T1D Exchange and DPV Germany and Austria registries.

Methods

- Registry participants in DPV and T1DX aged <18yrs with T1D duration ≥ 1yr with available data in any of the following years were included: 2011, 2013, 2015 and 2017 (N for each year by registry shown in Table 1).
- CGM use (including both real-time and intermittently scanned CGM) and most recent HbA1c at each data collection time point were obtained from clinic medical records.
- Linear regression was used to compare CGM use and mean HbA1c within each registry adjusted for age, gender and minority status.

Results

Table 1. Participant Characteristics

<table>
<thead>
<tr>
<th></th>
<th>T1D</th>
<th>T1DX</th>
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</thead>
<tbody>
<tr>
<td>Age, yrs - mean±SD</td>
<td>123.3±3.6</td>
<td>123.3±3.3</td>
</tr>
<tr>
<td></td>
<td>6±13 yrs</td>
<td>6±13 yrs</td>
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<td></td>
<td>13±18 yrs</td>
<td>13±18 yrs</td>
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<tr>
<td>Gender – male</td>
<td>51%</td>
<td>52%</td>
</tr>
<tr>
<td>Diabetes Duration, yrs - mean±SD</td>
<td>5±3.5</td>
<td>5±3.5</td>
</tr>
<tr>
<td>HbA1c, % (mmol/mol) – median (IQR)</td>
<td>7.9±1.3, 7.9±1.3</td>
<td>6.9±1.5, 6.9±1.4</td>
</tr>
<tr>
<td>Minority Status</td>
<td>20%</td>
<td>22%</td>
</tr>
<tr>
<td>Pump Use</td>
<td>43%</td>
<td>56%</td>
</tr>
<tr>
<td>CGM Use</td>
<td>4%</td>
<td>3%</td>
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</tbody>
</table>

Figure 1. CGM Use by Year and Registry

Figure 2. CGM Use by Year and Age Group

Figure 3. CGM Use by Year and Gender

Figure 4. CGM Use by Year and Minority Status

Figure 5. CGM Use by Year and Insulin Delivery Method

Summary

- CGM use increased from 2011 to 2017 in all age groups in both registries, and was most pronounced in the youngest patients.
- In the DPV registry, CGM use remained steady from 2011 to 2015 with a dramatic increase from 4% to 44% occurring between year 2015 and 2017, whereas for T1DX, CGM use doubled from 4% in 2013 to 14% in 2015 to 31% in 2017.
- CGM use in both registries increased from 2011 to 2017 regardless of gender, minority status or insulin delivery method. However injection users in T1D registry did not increase at a similar rate as pump users.
- In 2017, among participants with available data, the most common type of CGM was real-time CGM for T1DX and intermittently scanned CGM (isCGM) in DPV.

Conclusions

- Pediatric CGM use increased in both registries but at different rates from 2011 to 2017.
- Increase in CGM use over time is likely reflective of changes in insurance coverage and improvements in device technology and availability.
- As penetration of this technology is lowest in adolescents, a group noted to have the highest mean A1c, strategies to engage this cohort of youth in adoption and long-term use of CGM are needed.