INTRODUCTION

- There is growing interest in the use of real-world evidence to support clinical decision-making, which has limitations versus use of data sources other than randomized controlled trials (RCTs).1

- This approach recognizes that while RCTs provide a gold standard for testing treatment hypotheses, generating the findings to larger, more diverse populations may be difficult.2

- Two second-generation basal insulin (BI) analogs, insulin glargine 300 U/mL (Gla-300) and insulin degludec (IDeg), have a smoother action profile and a lower risk of hypoglycemia compared with first-generation analogs.3

- However, the outcomes of switching from BI analog to Gla-300 or IDeg in routine real-world clinical practice settings require further investigation.

OBJECTIVE

The LIGHTNING study utilized real-world electronic health record (EHR) data, representative of the general outpatient and real-life practice, to assess hypoglycemia rates in patients with T2DM who switched from Gla-100 to Gla-300 or IDeg in routine real-world clinical practice settings.

METHODS

- Data source: LIGHTNING used the Humedica database (www.optum.com), which includes >7 million records from >1000 hospitals and 7000 clinics.

- The dataset includes 779,813 people with T2DM receiving BI (Gla-100 U/mL, Gla-100, detemir (IDet) U/mL, IDet, or Gla-300 U/mL, IDeg) from January 1, 2008, to December 31, 2016.

- PHIYA, per 100 patient-years; PSM, propensity score matching; 4.4 (2.6)hypoglycemic events (as admission often results in a change from baseline to treatment index or a treatment end). Treatment end was defined as the earliest of follow-up period (in the dataset, December 31, 2016), the change of prescription from the index BI to another or 1-year treatment index (HTT date). Duration for determining hypoglycemia rates was taken to be the duration of the patient treatment minus that of all inpatient stays during this period (as admission often results in a switch to an institutional treatment program). This preliminary analysis included data collected between April 1, 2015, and December 31, 2016, and individuals who switched to the following 8 treatments: Gla-300, Gla-100, IDet, and IDeg.

- Target outcomes:

  - Baseline characteristics

  - Hypoglycemic events were to be counted only within the defined study window.

  - Severe hypoglycemia was defined as an event that required the assistance of another person for determining hypoglycemia rates following a switch to either Gla-300 or comparator BI.

  - HbA1c reductions were similar in all three groups, with no statistically significant between-group differences (Figure 3).

  - The limitations of this preliminary analysis include the followings:

    - Predose B dose and the reason for switching to a different BI may have been a potential confounder.

    - The small sample size for the Gla-300 vs IDeg comparison made the results somewhat unstable.

    - The study was powered for the Gla-300 vs IDeg comparison only and was not powered to test for differences between Gla-300 and IDet.

DISCUSSION

- LIGHTNING indicates that switching to Gla-300 is associated with significantly lower rates of severe hypoglycemia versus IDeg and Gla-100, while maintaining comparable HbA1c reductions.

- Switching to Gla-300 was comparable to IDeg in terms of both severe hypoglycemia rates and glycemic control.

- These findings are in line with DESIR, a large, real-world analysis in the US, and similar to the EHR database that used data from the Predictive Health Intelligence Environment database that compared routine clinical outcomes when switching from Gla-100 to Gla-300 or IDeg.4 LIGHTNING, however, included a much larger real-world population.

CONCLUSIONS

-/lightning indicates significantly lower rates of severe hypoglycemia for Gla-300 vs first-generation BIs and an overall higher quality vs IDeg, without compromising HbA1c reduction, in patients with T2DM switching from any prescriber.

- Results are consistent with previous RCTs and other real-world analyses of Gla-300.