

A Real-World Data Analysis Evaluating the Time to Glycemic Control After Initiation of Basal Insulin in Type 2 Diabetic Patients



TriNetX

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BACKGROUND

The likely time frame for type 2 diabetes mellitus (T2DM) adult patients to respond to basal insulin (BI) in routine care in the United States has only recently been explored (1).

The pandemic of T2DM demands early and effective treatment to delay or prevent micro- and macrovascular complications associated with diabetes, but the majority of these patients do not reach their therapeutic goals as a result of insufficient therapeutic response (2).

Prior studies also suggest that there is a 'legacy effect' to treatment response and glycemic control—if patients achieve target glycated hemoglobin (HbA1c) levels soon after diagnosis, they have better long term outcomes than those who do not reach target levels early, even if control is relaxed later in the course of disease (3).

OBJECTIVES

The purpose of this study was to confirm findings of the recently published retrospective observational analyses that determined the likelihood of T2DM patients reaching glycemic control after starting basal insulin (BI) diminishes over time, and remains low from 12 months onwards. (See Figure 1)

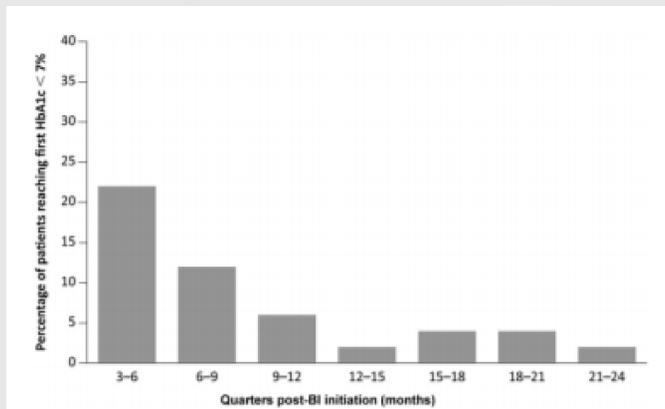


Figure 1: Percentage of patient reaching their first HbA1c < 7% post-BI initiation from a recently conducted analysis of a large dataset of U.S. electronic health records by Sanofi and IBM Watson Health.

Source: Literature (1)

METHODS

Data Source: Electronic medical records (EMR) were analyzed using TriNetX, a federated global health research network of >43 million patients as of January 2018.

Patient Cohorts: 18,920 patients were evaluated that met the following EMR criteria: US-only, age ≥ 18 years, T2DM diagnosis, documented first instance of BI, and had an HbA1c lab value during all 5 time periods—0-3, 3-6, 6-12, 12-24, and 24-36 month intervals from BI initiation

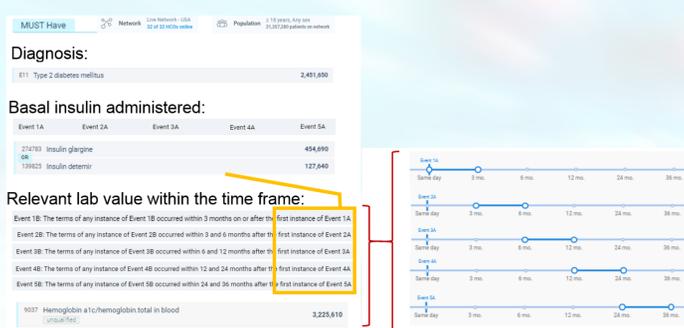


Figure 2: Patient cohort definition and stata.

Outcomes: The time to reach ADA target glycemic control (defined as HbA1c ≤7%) was measured in response to treatment in 0-3, 3-6, 6-12, 12-24, and 24-36 month intervals from BI initiation. Success of glycemic control on BI was defined as a patient who achieved target HbA1c and did not have HbA1c >7% in the same or in any prior time interval.

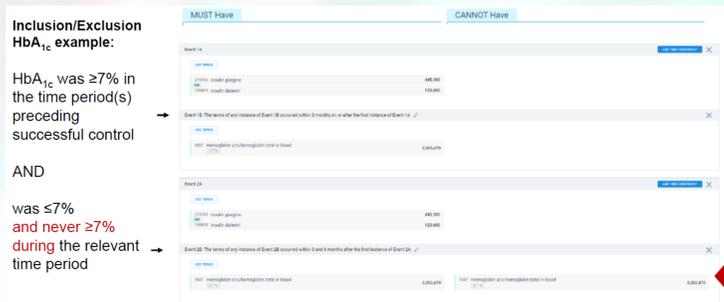
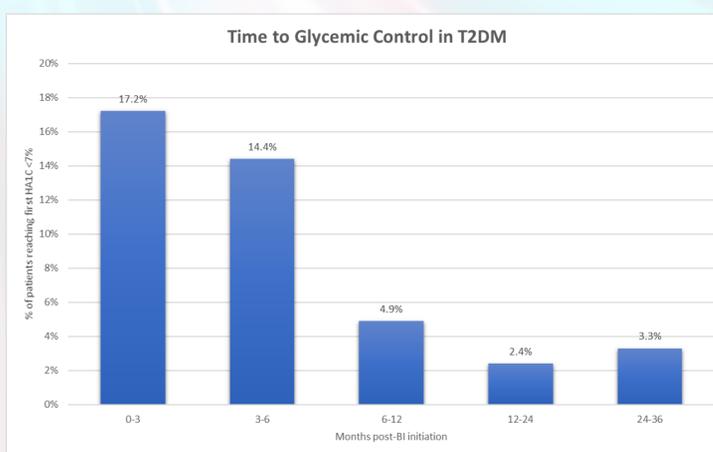


Figure 3: Example of successful ADA target glycemic control.

RESULTS

- 18,920 patients fulfilled the eligibility criteria including HbA1c data for all time intervals measured.
- 52% were female and mean age was 58 years.
- 17.2% of patients achieved glycemic control within 3 months of taking BI while 14.4% of the cohort responded within 3-6 months of initiating therapy.
- The response rate vastly decreased after 6 months with only 4.9% responding in the 6-12 post BI window and even less responders in the subsequent 12-24 month (2.4%) and 24-36 month (3.3%) time periods.

| Patients Achieving Success (HbA _{1c} ≤7% if not successful in previous period) | | | | | |
|---|-------|-------|------|-------|-------|
| Months after initiation of BI: | 0-3 | 3-6 | 6-12 | 12-24 | 24-36 |
| # Patients in cohort 18,920 | 17.2% | 14.4% | 4.9% | 2.4% | 3.3% |



Figures 4, 5 & 6: Percentages of T2DM cohorts achieving glycemic control by time after BI initiation.

CONCLUSIONS

- If glucose is not controlled early by BIs, then likelihood of success decreases as time passes.
- The findings in this real-world study conducted on electronic medical records (EMR) of a T2DM population from the TriNetX Live platform confirm the results of the recently published analyses conducted by a Sanofi and IBM Watson collaboration among others.
- Access to EMR data with an analytic platform efficiently generated valuable insights on the success of BI treatment response timelines in a real-world T2DM population.

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