Incidence of Diabetic Ketoacidosis among Patients with Type 2 Diabetes Mellitus Treated with SGLT2 inhibitors or Other Antihyperglycemic Agents- A Retrospective, Observational, New-User Cohort Study Using 4 Administrative Claims Databases in the US

First published: 26/04/2018

Last updated: 02/07/2024

Study Finalised

Administrative details

EU PAS number

EUPAS23705

Study ID

34362

DARWIN EU® study

No

Study countries

United States

Study status

Finalised

Research institutions and networks

Institutions

Johnson & Johnson

First published: 01/02/2024

Last updated: 01/02/2024

Institution

Contact details

Study institution contact

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Study contact

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Primary lead investigator

Lu Wang

Primary lead investigator

Study timelines

Date when funding contract was signed
Planned: 18/04/2018

Actual: 18/04/2018

Study start date
Planned: 18/04/2018

Actual: 18/04/2018

Date of final study report
Planned: 08/10/2018

Actual: 01/10/2018

Sources of funding

- Pharmaceutical company and other private sector

More details on funding

Janssen Research & Development, LLC

Regulatory

Was the study required by a regulatory body?

Yes

Is the study required by a Risk Management Plan (RMP)?

EU RMP category 3 (required)

Methodological aspects

Study type

Study topic:

Disease /health condition

Human medicinal product

Study type:

Non-interventional study

Scope of the study:

Assessment of risk minimisation measure implementation or effectiveness

Disease epidemiology

Safety study (incl. comparative)

Data collection methods:

Secondary use of data

Main study objective:

The main objective of this study is to compare diabetic ketoacidosis (DKA) incidence between new users of sodium-glucose co-transporter 2 inhibitors (SGLT2i, combined and separate) and new users of other antihyperglycemic agents (AHAs) among patients diagnosed with type 2 diabetes (T2DM). This study will also identify precipitating events and evaluate risk factors for incident DKA.

Study Design

Non-interventional study design

Cohort

Study drug and medical condition

Medicinal product name

INVOKANA

Study drug International non-proprietary name (INN) or common name

CANAGLIFLOZIN

Anatomical Therapeutic Chemical (ATC) code

(A10BK02) canagliflozin

canagliflozin

Medical condition to be studied

Diabetic ketoacidosis

Population studied

Short description of the study population

Patients who had a diagnosis of T2DM preceding new use of an SGLT2i or at least one pre-specified comparator AHAs during the study period and had at least 365 days of continuous enrollment prior to the first day of new drug exposure (index date).

Age groups

- Adults (18 to < 46 years)
- Adults (46 to < 65 years)
- Adults (65 to < 75 years)
- Adults (75 to < 85 years)
- Adults (85 years and over)

Special population of interest

Other

Special population of interest, other

Type 2 diabetes mellitus patients

Estimated number of subjects

409.360

Study design details

Outcomes

Diabetic ketoacidosis

Data analysis plan

The crude incidence rates of DKA in the different AHA new-user groups will be estimated as the number of incident DKA cases divided by the total follow-up time at risk. Baseline patient characteristics including risk factors for DKA will be summarized for those treated with SGLT2i versus other AHAs. A conditional Cox proportional hazards model based on time-to-first event approach will be used to estimate Hazard Ratio (HR) associated with SGLT2i (combined and separate) versus other AHAs, with each exposure propensity-score matched set treated as a separate stratum in Cox model. The exposure propensity score will be estimated through large-scale regularized regression, with demographics, all prior conditions/drugs/procedures, risk scores, utilization density as baseline covariates. An empirical p-value calibration using negative control outcomes will be conducted to address potential systematic bias. HRs, 95% CIs, pre- and post- calibration p values will all be reported.

Documents

Study results

CSR Synopsis_RRA-21651_EUPAS23705.pdf (131.75 KB)

Data management

ENCePP Seal

The use of the ENCePP Seal has been discontinued since February 2025. The ENCePP Seal fields are retained in the display mode for transparency but are no longer maintained.

Data sources

Data sources (types)

Administrative healthcare records (e.g., claims)

Use of a Common Data Model (CDM)

CDM mapping

No

Data quality specifications

Check conformance

Unknown

Check completeness

Unknown

Check stability

Unknown

Check logical consistency

Unknown

Data characterisation

Data characterisation conducted

No