Multi-country non-interventional study on the effectiveness and safety of Empagliflozin in adult patients with type 2 diabetes in Europe and Asia

First published: 21/01/2019

Last updated: 02/04/2024

Study Finalised

Administrative details

EU PAS number

EUPAS27606

Study ID

50641

DARWIN EU® study

No

Study countries

- [ ] Denmark
- [ ] Finland
- [ ] Germany

- [ ] Israel
- [ ] Japan
- [ ] Korea, Republic of
- [ ] Norway
- [ ] Spain
- [ ] Sweden
- [ ] Taiwan
- [ ] United Kingdom

Study description

The overall objective of this study is to examine effectiveness, safety, health care resource utilization, and cost of care outcomes associated with the use of empagliflozin or any SGLT-2 inhibitors, compared with use of dipeptidyl peptidase-4 (DPP-4) inhibitors, among patients with T2DM. This study will utilize nationwide healthcare registers, regional quality registers, regional high-quality medical health records, and other health claims data available in Denmark, Finland, Germany, Israel, Japan, Norway, South Korea, Spain, Sweden, Taiwan, and United Kingdom.

Study status

Finalised

Research institutions and networks

Institutions

Real World Solutions, IQVIA

- [ ] Netherlands

☐ United Kingdom (Northern Ireland)

First published: 28/04/2011

Last updated: 22/03/2024

Institution | Other | ENCePP partner

University of Ulm Germany, Maccabi Israel, Syneos Health Japan, TFS / Quantify Denmark, Finland, Norway, Sweden, Ajou University Hospital South Korea, Institut d'Investigació en Atenció Primària Spain, Institute of Clinic Hospital of Valencia Spain, TaSPOR Taiwan, University of Leicester UK

Contact details

Study institution contact

Fabian Hoti PAS_registrations@iqvia.com

Study contact

PAS_registrations@iqvia.com

Primary lead investigator

Fabian Hoti

Primary lead investigator

Study timelines

Date when funding contract was signed
Planned: 29/08/2018

Actual: 29/08/2018

Study start date
Planned: 31/03/2019

Actual: 22/04/2019

Data analysis start date
Actual: 13/05/2019

Date of final study report
Planned: 31/05/2022

Actual: 27/06/2022

Sources of funding

- Pharmaceutical company and other private sector

More details on funding

Boehringer Ingelheim

Study protocol

1245-0195-protocol-v1-0-final.pdf (1.43 MB)

1245-0195-protocol-v2-0-final.pdf (1.12 MB)

Regulatory

Was the study required by a regulatory body?

No

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

Not applicable

Methodological aspects

Study type

Study type list

Study topic:

Disease /health condition

Human medicinal product

Study type:

Non-interventional study

Scope of the study:

Effectiveness study (incl. comparative)

Data collection methods:

Combined primary data collection and secondary use of data

Main study objective:

The overall objective of this study is to examine effectiveness, safety, health care resource utilization, and cost of care outcomes associated with the use of

empagliflozin or any SGLT-2 inhibitors, compared with use of dipeptidyl peptidase-4 (DPP-4) inhibitors, among patients with T2DM.

Study Design

Non-interventional study design

Cohort

Study drug and medical condition

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

EMPAGLIFLOZIN

DAPAGLIFLOZIN

CANAGLIFLOZIN

ERTUGLIFLOZIN

SITAGLIPTIN

VILDAGLIPTIN

SAXAGLIPTIN

ALOGLIPTIN

LINAGLIPTIN

METFORMIN

Medical condition to be studied

Type 2 diabetes mellitus

Population studied

Short description of the study population

Adult patients aged 18 years or older diagnosed with type 2 diabetes mellitus (T2DM) identified from Denmark, Finland, Germany, Israel, Japan, Norway, South Korea, Spain, Sweden, Taiwan, and the United Kingdom. The study population consisted of 3 sub-cohorts included patients with empagliflozin use, any SGLT-2 inhibitor use, and any DPP-4 inhibitor use.

Inclusion criteria:

- Dispensation or any other record of empagliflozin, any SGLT2i, or any DPP4i use during the study period,
- No dispensation or any other record of any other SGLT2i or DPP4i use during the 12 months preceding the index date, and
- Having a diagnosis of T2DM before the index date, based on codes from the 10th revision (ICD-10) of the International Classification of Diseases and Related Health Problems (ICD) or other available data.
- For the Nordic countries, history of metformin prescription at any time in the past was also an additional inclusion criterion.

Exclusion criteria:

- Aged <18 years on the first dispensation date or date of the first record of empagliflozin, any SGLT2i or any DPP-4 inhibitor use,
- Pre-existing diagnosis of T1DM during the 12 months before the index date,
- Pre-existing diagnosis of secondary diabetes or gestational diabetes in the 12 months prior to the index date
- Having a diagnosis of ESRD during the 12 months before the index date,
- <12 months of available data before the index date (less than 6 months for Germany), and/or no complete history of drug dispensations/other records of drug use during this period, or missing or ambiguous data on age or sex

---

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

Patients with type 2 diabetes

Estimated number of subjects

150000

Study design details

Outcomes

Secondary objectives are related to cardiovascular and renal effectiveness, safety, healthcare resource utilization and cost of care. Secondary objectives related to effectiveness are to examine the risk of coronary revascularization procedures, end-stage renal disease, cardiovascular mortality, and two composite outcomes: one including hospitalization for heart failure and cardiovascular mortality and another including MI, stroke, and cardiovascular mortality (MACE) and examine healthcare resource utilization and cost of care.

Data analysis plan

Individual level data will be analyzed in countries. To meet the objectives of the multi-country study, aggregate-level results obtained from the countries will be combined: effectiveness and safety results will be pooled in a meta-analysis,

while HCRU and cost of care results will be combined descriptively. In each country, patients initiating treatment with empagliflozin or any other SGLT- 2 inhibitor will be compared with PS-matched patients initiating treatment with any DPP-4 inhibitor. Pairwise PS models will be estimated using logistic regression including appropriate covariates. The primary and secondary effectiveness outcomes and safety outcomes will be analyzed and compared across subcohorts by incidence rates, cumulative-incidence plots, and Cox proportional hazards models. For secondary outcomes on healthcare resource utilization and cost of care, number of visits, inpatient days, dispensations and amount of costs will be determined during follow-up.

Documents

Study results

1245.195 Synopsis.pdf (639.71 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 source(s)

Sweden National Prescribed Drugs Register / Läkemedelsregistret

The Information System for Research in Primary Care (SIDIAP)

Clinical Practice Research Datalink

Data source(s), other

The Swedish prescribed drug register, SIDIAP, NorPD, CPRD

Data sources (types)

Administrative healthcare records (e.g., claims)

Disease registry

Drug dispensing/prescription data

Electronic healthcare records (EHR)

Other

Data sources (types), other

Prospective patient-based data collection

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