A multicentre international randomized parallel group double-blind placebo-controlled clinical trial of EMPAgliflozin once daily to assess cardio-renal outcomes in patients with chronic KIDNEY disease (EMPA-KIDNEY)

First published: 11/03/2022

Last updated: 05/10/2026

Study Finalised

Administrative details

EU PAS number

EUPAS46175

Study ID

49688

DARWIN EU® study

No

Study countries

Canada
China
Germany
Italy
Japan
Malaysia
United Kingdom
United States

Study description

The primary aim of the study is to investigate the effect of empagliflozin on kidney disease progression or cardiovascular death versus placebo on top of standard of care in patients with pre-existing chronic kidney disease

Study status

Finalised

Research institutions and networks

Institutions

Multiple centres: 241 centres are involved in the study

Contact details

Study institution contact

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Study contact

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Primary lead investigator

William Herrington

Primary lead investigator

Study timelines

Date when funding contract was signed

Actual: 13/04/2018

Study start date

Actual: 01/02/2019

Data analysis start date

Actual: 09/09/2022

Date of final study report

Planned: 19/04/2023

Actual: 28/10/2022

Sources of funding

- Pharmaceutical company and other private sector

More details on funding

Boehringer Ingelheim

Study protocol

EMPA-KIDNEY_Protocol_v2p0.pdf (792.43 KB)

Regulatory

Was the study required by a regulatory body?

No

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

EU RMP category 3 (required)

Other study registration identification numbers and links

1245-0137

ClinicalTrial.gov NCT03594110

(https://clinicaltrials.gov/ct2/show/NCT03594110)

Methodological aspects

Study type

Study type list

Study topic:

Disease /health condition

Human medicinal product

Study type:

Clinical trial

Scope of the study:

Effectiveness study (incl. comparative)

Safety study (incl. comparative)

Data collection methods:

Primary data collection

Main study objective:

The primary objective of the study is to investigate the effect of empagliflozin on kidney disease progression or cardiovascular death versus placebo on top of standard of care in patients with pre-existing chronic kidney disease

Study Design

Clinical trial phase

Therapeutic confirmatory (Phase III)

Clinical trial randomisation

Randomised clinical trial

Study drug and medical condition

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

EMPAGLIFLOZIN

Medical condition to be studied

Chronic kidney disease

Population studied

Short description of the study population

Patients with pre-existing chronic kidney disease (at least one-third with diabetes and one-third without diabetes) treated with empagliflozin and matching placebo on top of standard of care.

Inclusion criteria:

Evidence of progressive CKD at risk of kidney disease progression is defined on the basis of local laboratory results recorded at least 3 months before and at the time of the Screening visit, and requires that:

• CKD-EPI eGFR ≥20 <45 mL/min/1.73m²; or

• CKD-EPI eGFR ≥45 <90 mL/min/1.73m2 with urinary albumin: creatinine ratio ≥200 mg/g (or protein: creatinine ratio ≥300 mg/g)

Exclusion criteria

• Currently receiving SGLT-2 or SGLT-1/2 inhibitor

• Diabetes mellitus type 2 and prior atherosclerotic cardiovascular disease with an eGFR >60 mL/min/1.73m2 at Screening;

• Receiving combined ACEi and ARBf treatment

• Maintenance dialysis, functioning kidney transplant, or scheduled living donor transplant

• Polycystic kidney disease;

• Previous or scheduled bariatric surgery;
• Ketoacidosis in the past 5 years;
• Symptomatic hypotension, or systolic blood pressure <90 or >180 mmHg at Screening;
• ALT or AST >3x ULN at Screening;
• Hypersensitivity to empagliflozin or other SGLT-2 inhibitor

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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

Renal impaired

Estimated number of subjects

6.000

Study design details

Outcomes

Composite primary outcome: Time to first occurrence of (i) kidney disease progression (defined as ESKD, a sustained decline in eGFR to <10 mL/min/1.73m², renal death, or a sustained decline of ≥40% in eGFR from randomization) or (ii) Cardiovascular death. End Stage Kidney Disease (ESKD) is defined as the initiation of maintenance dialysis or receipt of a kidney transplant, 1. Time to first hospitalization for heart failure or cardiovascular

death 2. Time to occurrences of all-cause hospitalizations (first and recurrent combined) 3. Time to death from any cause 4. Time to kidney disease progression 5. Time to cardiovascular death 6. Time to cardiovascular death or end-stage kidney disease

Data analysis plan

For the time-to-event analyses survival analytic methods will be used to evaluate the time to the first event during the entire trial period. For each categorical outcome, Cox proportional hazards regression adjusted for age, sex, prior diabetes, eGFR, urinary albumin:creatinine ratio, and region will be used to estimate the hazard ratio comparing all those allocated to active empagliflozin with all those allocated to placebo. Estimates of the hazard ratio will be shown with 95% confidence intervals. For the secondary outcome of all-cause hospitalisation, the analysis examined all events (i.e. not just the first event in each participant). Cumulative incidence function (CIF) and/or Kaplan Meier plots were produced where appropriate. For details refer to the Data Analysis Plan published on www.empakidney.org.

Documents

Study results

1245-0137_Synopsis (1).pdf (4.7 MB)

Study publications

Baigent C, Emberson J, Haynes R, Herrington WG, Judge P, Landray MJ, Mayne KJ, ...

EMPA-Kidney Collaborative Group. Empagliflozin in patients with chronic kidney ...

Herrington WG, Preiss D, Haynes R, Eynatten M, von Staplin N, Hauske SJ et al. ...

"Design, recruitment, and baseline characteristics of the EMPA-KIDNEY trial." N...

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)

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