Association between use of direct oral anticoagulants (DOACs) and increased risk of interstitial lung disease

First published: 08/05/2024

Last updated: 06/10/2025

Study Finalised

Administrative details

EU PAS number

EUPAS1000000133

Study ID

1000000133

DARWIN EU® study

No

Study countries

Germany

Italy

Spain

United Kingdom

Study description

New user active comparator cohort study examining the association between direct oral anticoagulant (DOAC) use and incidence of ILD compared to users of vitamin K antagonists among people with atrial fibrillation and venous thromboembolism.

Study status

Finalised

Research institutions and networks

Institutions

European Medicines Agency (EMA)

First published: 01/02/2024

Last updated: 01/02/2024

Institution

Contact details

Study institution contact

Daniel Morales daniel.morales@ema.europa.eu

Study contact

daniel.morales@ema.europa.eu

Primary lead investigator

Daniel Morales

Primary lead investigator

Study timelines

Date when funding contract was signed
Planned: 24/03/2023

Study start date
Planned: 24/03/2023

Actual: 24/03/2023

Date of final study report
Planned: 01/03/2024

Actual: 11/07/2024

Sources of funding

- EMA

More details on funding

EMA in house resources

Study protocol

PROTOCOL-DOAC-ILD.pdf (225.76 KB)

Regulatory

Was the study required by a regulatory body?

Yes

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:

Safety study (incl. comparative)

Data collection methods:

No individual level data collected for the purpose of the study

Study design:

New user active comparator cohort study

Main study objective:

Assess whether use of factor Xa (FXa) inhibitors (edoxaban, apixaban and rivaroxaban) or direct thrombin inhibitor (dabigatran) associated with an increased risk of interstitial lung disease (ILD) when compared with patients treated with vitamin K antagonists (VKA), among patients with Atrial Fibrillation (AF), Deep Vein Thrombosis (DVT) and Pulmonary Embolism (PE).

Study Design

Non-interventional study design

Cohort

Study drug and medical condition

Medicinal product name, other

DOACs and vitamin-k antagonists

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

APIXABAN

DABIGATRAN

EDOXABAN

RIVAROXABAN

Anatomical Therapeutic Chemical (ATC) code

(B01) ANTITHROMBOTIC AGENTS

ANTITHROMBOTIC AGENTS

(B01AE07) dabigatran etexilate

dabigatran etexilate

(B01AF01) rivaroxaban

rivaroxaban

(B01AF02) apixaban

apixaban

Medical condition to be studied

Interstitial lung disease

Population studied

Short description of the study population

People with atrial fibrillation

People with venous thromboembolism

Age groups

- **Adult and elderly population (≥18 years)**
  - Adults (18 to < 65 years)
    - Adults (18 to < 46 years)
    - Adults (46 to < 65 years)
  - Elderly (≥ 65 years)
    - Adults (65 to < 75 years)
    - Adults (75 to < 85 years)
    - Adults (85 years and over)

Study design details

Setting

Primary care data sources

Comparators

Vitamin-K antagonists

Outcomes

Interstitial lung disease (ILD)

Data analysis plan

Propensity score matched cohort study with use of propensity score diagnostics to assess adequate confounding control.
Use of Cox regression to estimate hazard ratios for incident ILD among the target cohort (DOAC users) and control cohort (VKA users).

Documents

Study report

DOACs and ILD Study Report.pdf (1.52 MB)

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)

IQVIA Medical Research Data - OMOP

IQVIA Disease Analyzer Germany

THIN® (The Health Improvement Network®)

Data source(s), other

The Health Improvement Network (THIN®) Italy

The Health Improvement Network (THIN®) Spain

Use of a Common Data Model (CDM)

CDM mapping

Yes

Data quality specifications

Check conformance

Unknown

Check completeness

Unknown

Check stability

Unknown

Check logical consistency

Unknown

Data characterisation

Data characterisation conducted

Yes

Data characterisation moment

after data extraction

Data characterisation details

Inspection of code frequencies, comparison with expected incidence.