DARWIN EU® - Azathioprine - user characteristics

First published: 26/09/2024

Last updated: 14/08/2026

Study Finalised

Administrative details

EU PAS number

EUPAS1000000322

Study ID

1000000322

DARWIN EU® study

Yes

Study countries

Germany

Netherlands

Spain

United Kingdom

Study description

Azathioprine is a purine analogue and prodrug of mercaptopurine that is used as an immunosuppressive medication alone or in combination with other immunosuppressive therapy to prevent rejection following organ transplantation and to treat certain autoimmune diseases, where it is considered a steroid-sparing agent. Examples of autoimmune diseases that could be treated with azathioprine are rheumatoid arthritis, inflammatory bowel disease, systemic lupus erythematosus (SLE), polymyositis, dermatomyositis, multiple sclerosis (MS) and myasthenia gravis.
Azathioprine is associated with minor usually transient and asymptomatic elevations of aminotransferase levels and with rare instances of acute cholestatic liver injury and with long-term use, portal hypertension may occur.
A signal procedure regarding a potential association between azathioprine and non-cirrhotic portal hypertension/portosinusoidal vascular disease (PSVD) - which is a rare disorder characterised by signs of portal hypertension in the absence of an identifiable etiology, such as cirrhosis - is needed. A liver biopsy is mandatory for the diagnosis of PSVD. Specific histologic signs include obliterative portal venopathy, nodular regenerative hyperplasia and incomplete septal fibrosis.
This study is intended to support the signal evaluation by providing information about the use of azathioprine, including the most frequent indications, the age- and sex distribution at initiation of treatment, and the treatment duration for all indications combined, and for each indication separately.

Study status

Finalised

Research institutions and networks

Institutions

Department of Medical Informatics - Health Data Science, Erasmus Medical Center (ErasmusMC)

Netherlands

First published: 03/11/2022

Last updated: 02/05/2024

Institution | Educational Institution | ENCePP partner

Networks

Data Analysis and Real World Interrogation Network (DARWIN EU®)

- Belgium
- Croatia
- Denmark
- Estonia
- Finland
- France
- Germany
- Greece
- Hungary
- Italy
- Lithuania
- Netherlands
- Norway

Poland

Portugal

Spain

Sweden

United Kingdom

United States

First published: 01/02/2024

Last updated: 05/11/2026

Network

Contact details

Study institution contact

Ilse Schuemie study@darwin-eu.org

Study contact

study@darwin-eu.org

Primary lead investigator

Katia Verhamme

Primary lead investigator

Study timelines

Date when funding contract was signed

Planned: 25/08/2024

Actual: 25/08/2024

Study start date
Planned: 25/08/2024

Actual: 26/08/2024

Date of final study report
Planned: 15/10/2024

Actual: 05/11/2024

Sources of funding

- EMA

Study protocol

DARWIN EU_Protocol_P3-C1-014_Azathioprine_V4.pdf (717.97 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:

Disease epidemiology

Drug utilisation

Data collection methods:

Secondary use of data

Study design:

New drug/s user cohort

Main study objective:

1. Characterise azathioprine initiators by sex and age at first prescription.

2. Identify potential indications for azathioprine, and the percentage of azathioprine-treated patients for each pre-defined approved indication:

a) Organ transplantation

b) Severe rheumatoid arthritis or chronic polyarthritis

c) Inflammatory bowel disease

d) Systemic lupus erythematosus

e) Dermatomyositis

f) Polyarteritis nodosa

g) Pemphigus vulgaris and bullous pemphigoid

h) Behçet's disease

i) Refractory autoimmune haemolytic anaemia

j) Refractory idiopathic thrombocytopenic purpura

k) Polymyositis

l) Pyoderma gangrenosum

m) Multiple sclerosis

n) Myasthenia gravis.

3. Large-scale characterisation overall and per indication of drugs and conditions within one year prior to the index date (-365 to -1 day to the index date) and on the index date will be assessed.

4. Estimate and summarise duration of treatment with azathioprine, overall, and stratified per indication.

Study Design

Non-interventional study design

Cohort

Study drug and medical condition

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

AZATHIOPRINE

Anatomical Therapeutic Chemical (ATC) code

(L04AX01) azathioprine

azathioprine

Population studied

Short description of the study population

Population of individuals newly treated with Azathioprine

Study design details

Setting

This study will use routinely collected health data from 5 databases in the DARWIN EU® network of data partners from 4 European countries. All databases were previously mapped to the OMOP CDM.

Data sources

1. Clinical Practice Research Datalink (CPRD) GOLD, United Kingdom
2. Integrated Primary Care Information (IPCI), Netherlands
3. IQVIA Disease Analyzer Germany (IQVIA DA Germany), Germany
4. Institut Municipal Assistència Sanitària Information System (IMASIS), Spain
5. The Information System for Research in Primary Care (SIDIAP), Spain

---

Outcomes

Outcomes of interest

• Characteristics (sex and age)

• Indication

- Organ transplantation
- Severe rheumatoid arthritis or chronic polyarthritis
- Inflammatory bowel diseases
- Autoimmune hepatitis
- Systemic lupus erythematosus
- Dermatomyositis
- Polyarteritis nodosa
- Pemphigus vulgaris and bullous pemphigoid
- Behcet’s disease
- Refractory autoimmune haemolytic anaemia

- Refractory idiopathic thrombocytopenic purpura
- Polymyositis
- Pyoderma gangrenosum
- Multiple sclerosis
- Myasthenia gravis
- None of the above/missing

• Large-scale characterisation: drugs and comorbidities within one year prior to the index date (
365 to -1 day to the index date) and on the index date
• Treatment duration, overall and by indication

Summary results

In this study the number of incident azathioprine ranged between 692 to 31,857 patients in the different databases. Azathioprine users were slightly more often female than male, with a median age ranging between 48-53 years. Median treatment duration ranged between 90 to 1,019 days and most patients had a treatment duration of less than 1 year. IBD was most often the indication for azathioprine use, followed by autoimmune hepatitis. In the azathioprine users without an indication prednisone/prednisolone was the most prescribed drug in the year before treatment initiation. Lastly conditions related to abdominal pain and IBD, specifically Crohn's disease and ulcerative colitis, were also often present in the year before treatment initiation in azathioprine users without an indication.

Documents

Study report

DARWIN EU_Report_P3-C1-014 Azathioprine_V3.pdf (1.27 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)

The Information System for Research in Primary Care (SIDIAP)

Integrated Primary Care Information (IPCI)

Clinical Practice Research Datalink (CPRD) GOLD

IQVIA Disease Analyzer Germany

Institut Municipal d'Assistència Sanitària Information System / Hospital del Mar / PSMAR / (Hospital del Mar Information System)

Data sources (types)

Electronic healthcare records (EHR)

Use of a Common Data Model (CDM)

CDM mapping

Yes

CDM Mappings

CDM name

OMOP

CDM website

https://www.ohdsi.org/Data-standardization/

Data quality specifications

Check conformance

Unknown

Check completeness

Unknown

Check stability

Unknown

Check logical consistency

Unknown

Data characterisation

Data characterisation conducted

Unknown