A non-interventional post-authorisation safety study to investigate the risk of mortality in multiple sclerosis patients treated with alemtuzumab (LEMTRADA®) relative to comparable multiple sclerosis patients using other disease modifying therapies: a cohort study

First published: 26/08/2021

Last updated: 23/10/2025

Study Finalised

Administrative details

EU PAS number

EUPAS42543

Study ID

50544

DARWIN EU® study

No

Study countries

Belgium

Czechia

Denmark

Germany

Sweden

United Kingdom

Study status

Finalised

Research institutions and networks

Institutions

Parexel International

United States

First published: 19/10/2010

Last updated: 10/12/2024

Institution | Non-Pharmaceutical company | ENCePP partner

Leibniz Institute for Prevention Research and Epidemiology - BIPS

Germany

First published: 29/03/2010

Last updated: 30/03/2026

Institution | Not-for-profit | ENCePP partner

ReMuS, nadacni fond (ReMuS)

Czechia

First published: 19/09/2025

Last updated: 19/09/2025

Institution | Laboratory/Research/Testing facility | Not-for-profit | ENCePP partner

The Danish Multiple Sclerosis Registry Denmark, AIM-IMA (L'Agence Intermutualiste - Het InterMutualistisch Agentschap) Belgium, The Swedish Multiple Sclerosis Registry Sweden, The Czech Multiple Sclerosis Registry (ReMuS) Czechia, University Hospital of Wales Wales, Cambridge University Hospitals England, Derriford Hospital/ Plymouth University England

Contact details

Study institution contact

Patient Safety and Pharmacovigilance - Pharmacoepidemiology lead Contact-US@sanofi.com

Study contact

Contact-US@sanofi.com

Primary lead investigator

Katja M Hakkarainen

Primary lead investigator

Study timelines

Date when funding contract was signed

Planned: 19/10/2020

Actual: 19/10/2020

Study start date

Planned: 01/05/2021

Actual: 07/09/2021

Date of interim report, if expected

Planned: 31/12/2023

Actual: 19/12/2023

Date of final study report

Planned: 30/09/2024

Actual: 20/09/2024

Sources of funding

- Pharmaceutical company and other private sector

More details on funding

Sanofi-Genzyme

Study protocol

alemtuzumab-lemtrada-pass-mort-protocol-may-2021_Redacted.pdf (2.09 MB)

Redacted_ lem-mortality[csa002]-protocol-amendment-v4.0.pdf (2.02 MB)

Regulatory

Was the study required by a regulatory body?

Yes

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

EU RMP category 1 (imposed as condition of marketing authorisation)

Regulatory procedure number

EMEA/H/C/003718

Methodological aspects

Study type

Study type list

Study topic:

Human medicinal product

Study type:

Non-interventional study

Scope of the study:

Safety study (incl. comparative)

Data collection methods:

Combined primary data collection and secondary use of data

Main study objective:

The primary objective is to ascertain whether multiple sclerosis (MS) patients treated with LEMTRADA have a higher risk of all-cause mortality than comparable MS patients treated with other HE-DMT.

Study Design

Non-interventional study design

Cohort

Study drug and medical condition

Medicinal product name

LEMTRADA

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

ALEMTUZUMAB

Anatomical Therapeutic Chemical (ATC) code

(L04AG06) alemtuzumab

alemtuzumab

Medical condition to be studied

Multiple sclerosis

Population studied

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)

Estimated number of subjects

9.000

Study design details

Outcomes

The primary outcome is the all-cause mortality.

The secondary outcome is the cause-specific mortality.

This secondary outcome will be exploratory as it is anticipated that availability and quality of cause-specific mortality data will be variable across data sources.

Data analysis plan

The following statistical analyses will be conducted separately in each data source:

- Descriptive statistics
- Crude and age-standardised mortality rates will be computed by exposure group (LEMTRADA vs other HE-DMT), for all MS patients and by gender.
- Propensity score (PS) model will be constructed in order to create two comparable groups of patients with similar distributions of risk factors (LEMTRADA vs other HE-DMT). PS weight will be computed using the standardised mortality ratio method.
- Risk of death among the LEMTRADA group compared to the other HE-DMT group will be expressed as hazard ratio (HR) and computed from a PS weighted time-dependent Cox proportional hazards model that will include a time-dependent exposure. A meta-analysis will be performed by iPRI to combine all HR from each data source in order to obtain a global estimate of the risk of death in the LEMTRADA group compared to the other HE-DMT group.

Documents

Study results

alemtuzumab_mort_csa0002_abstract_upload_emahma_22april2025.pdf (198.38 KB)

Study, other information

lem_pass_mort_protocol_may192021.pdf (1.37 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)

German Pharmacoepidemiological Research Database

Data sources (types)

Administrative healthcare records (e.g., claims)

Disease registry

Electronic healthcare records (EHR)

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