Comparative Effectiveness and Safety of Drugs used in Rare Neuromuscular and Neurodegenerative Diseases (CAESAR)

First published: 10/11/2020

Last updated: 07/07/2026

Study Planned

Administrative details

EU PAS number

EUPAS37983

Study ID

37984

DARWIN EU® study

No

Study countries

Italy

Study description

CAESAR is an Italian multicenter retrospective cohort study on Rare Neuromuscular and Neurodegenerative diseases (RND), based on information available in regional administrative healthcare databases. The aims are 1) to describe the prescriptive patterns of drugs used for the treatment of patients affected by RND and identify patient characteristics associated to these patterns in the three Italian regions (Tuscany, Umbria, Lazio), accounting for over 10 million residents, and 2) to perform a comparative evaluation of the effectiveness and safety of drugs used for the treatment of RND, with a focus on specific active agents. The study population will be enrolled in the period 2009-2019, with a two-year look-back and at least 1 year of follow-up, including patients, resident in one of the three regions and affected by Amyotrophic lateral sclerosis (ALS), Progressive muscular atrophy (PMA), Pseudobulbar palsy, Progressive bulbar palsy (PBP), Primary lateral sclerosis (PLS), Other motor neuron disease, Myasthenia gravis (MG). Patients will be defined from Hospital discharge records (ICD-9-CM codes), disease specific copayment exemptions, and, as far as possible, disease specific drug treatments. Drug utilisation patterns will be based on drugs (ATC codes) prescribed to outpatients using the DDDs. Safety and effectiveness will be investigated using a new-user approach and applying both, intention-to-treat and as-treated analysis. Clinical data available in two of the participating regions for ALS patients will be used to 1) validate the algorithm used for patient identification, 2) validate the exposure definition, and 3) perform external adjustment. Data and analysis ill be managed through a common data model, with shared data scripts, performing the analysis at regional level (in-house) and pooling aggregated anonymous data to obtain overall results.

Study status

Planned

Research institutions and networks

Institutions

Department of Epidemiology of the Regional Health Service - Lazio

Italy

First published: 23/03/2010

Last updated: 22/06/2018

Institution | Outdated | EU Institution/Body/Agency | ENCePP partner

Unit of adverse drug reactions monitoring (UADRM), University Hospital of Pisa

Italy

First published: 08/01/2014

Last updated: 07/07/2026

Institution | Educational Institution | Hospital/Clinic/Other health care facility | ENCePP partner

Department of Epidemiology of the Regional Health Service - Lazio

Italy

First published: 23/03/2010

Last updated: 22/06/2018

Institution | Outdated | EU Institution/Body/Agency | ENCePP partner

Pharmacovigilance and Pharmacoepidemiology Research Unit, Department Neurofarba, University of Florence

Italy

First published: 05/11/2020

Last updated: 08/07/2026

Institution | Educational Institution | ENCePP partner

National Center for Disease Prevention and Health Promotion, National Institute of Health Rome, Italy, University of Florence, Neurofarba Department Florence, Italy, Unit of Adverse Drug Reactions Monitoring, University Hospital of Pisa Pisa, Italy, Scarab Lab Florence, Italy, Umbria Region, Regional Pharmacovigilance Center Perugia, Italy, Umbria Region Perugia Hospital - Neuropathophysiology Perugia, Italy

Contact details

Study institution contact

Ursula Kirchmayer u.kirchmayer@deplazio.it

Study contact

u.kirchmayer@deplazio.it

Primary lead investigator

Ursula Kirchmayer

Primary lead investigator

Study timelines

Date when funding contract was signed

Planned: 23/09/2020

Actual: 23/09/2020

Study start date

Planned: 01/03/2021

Data analysis start date

Planned: 01/06/2021

Date of interim report, if expected

Planned: 25/10/2021

Date of final study report

Planned: 24/10/2022

Sources of funding

- Other

More details on funding

Italian Medicines Agency, Regional Drug Departme

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 type:

Non-interventional study

Scope of the study:

Drug utilisation

Effectiveness study (incl. comparative)

Main study objective:

Objective 1. describe the prescriptive patterns of the study drugs in patients affected by RND and identify patient characteristics associated to these patterns in the three Italian regions (Tuscany, Umbria, Lazio), accounting for over 10 million residents. Objective 2. comparative evaluation of the effectiveness and safety of drugs used for the treatment of RND, with a focus on specific agents

Study Design

Non-interventional study design

Cohort

Study drug and medical condition

Medical condition to be studied

Amyotrophic lateral sclerosis

Progressive muscular atrophy

Pseudobulbar palsy

Progressive bulbar palsy

Upper motor neurone lesion

Motor neurone disease

Myasthenia gravis

Additional medical condition(s)

Other RNDs might be included during the study

Population studied

Age groups

- Term newborn infants (0 – 27 days)
- Infants and toddlers (28 days – 23 months)
- Children (2 to < 12 years)
- Adolescents (12 to < 18 years)
- 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

5.000

Study design details

Outcomes

Overall and cause specific mortality, Admission to intensive care unit, Remission from corticosteroid use, discontinuation after a period of prescriptions with corticosteroids for systemic use, Adverse drug reactions (serious infections, autoimmune disease) - to be defined, Respiratory failure and tracheotomy (for ALS patients), Thymoma, thymectomy, myasthenia gravis crisis, use of intravenous immunoglobulins, plasmapheresis (for MG patients)

Data analysis plan

Data will be organised and managed through a common data model. Analysis will be performed running the shared scripts at local level and pooling aggregated data at the end. Drug utilization will be defined on the basis of DDDs, using different indicators: prevalence of use (by dividing the number of

drug users by the overall resident population), prevalence of use among patients in the cohort (by disease for single drugs), DDDs per 1000 users per day (the mean number of doses consumed every day by 1000 patients included in the cohort). CER will be performed through a propensity matched cohort design (head-to-head comparison between different drug groups/drugs). Patients in the compared exposure groups will be propensity matched. A group of patients not treated with any of the drugs will also be defined and compared. Intention-to-treat and As-treated analyses will be performed using Cox proportional Hazard models (HRs and 95%CIs).

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)

Mortality Information System

Drug claims information system

Hospital Information System

Healthcare Emergency Information System

ARS Toscana

Data source(s), other

MIS, PHARM, HIS, HEIS, ARS

Data sources (types)

Administrative healthcare records (e.g., claims)

Disease registry

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