A retrospective matched cohort study on the association between herpes zoster vaccination and dementia and mild cognitive impairment using electronic health records (ZOSTER-122 AIML 222419)

First published: 24/10/2023

Last updated: 04/08/2026

Study Finalised

Administrative details

EU PAS number

EUPAS107206

Study ID

108337

DARWIN EU® study

No

Study countries

United States

Study description

A study to determine the association between herpes zoster (HZ) vaccination and dementia and mild cognitive impairment using electronic health records.

Study status

Finalised

Research institutions and networks

Institutions

GlaxoSmithKline (GSK)

First published: 01/02/2024

Last updated: 01/02/2024

Institution

Contact details

Study institution contact

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Study contact

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Primary lead investigator

Call Center EU GSK Clinical Trials

Primary lead investigator

Study timelines

Date when funding contract was signed
Planned: 13/10/2023

Actual: 13/10/2023

Study start date
Planned: 24/10/2023

Actual: 24/10/2023

Date of final study report
Planned: 19/09/2025

Actual: 05/08/2025

Sources of funding

- Pharmaceutical company and other private sector

More details on funding

GlaxoSmithKline

Study protocol

Protocol Amendment 10 Anonymised 05 Jun 2026.pdf (2.38 MB)

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 topic:

Disease /health condition

Human medicinal product

Study type:

Non-interventional study

Scope of the study:

Disease epidemiology

Other

Safety study (incl. comparative)

If ‘other’, further details on the scope of the study

Hypothesis testing

Data collection methods:

Secondary use of data

Study design:

Retrospective, observational, matched-cohort study

Main study objective:

To determine if there is an association between either or both ZOSTAVAX and SHINGRIX and dementia primary or mild cognitive impairment (MCI) secondary using the same large scale, US electronic health record (EHR) database.

Study Design

Non-interventional study design

Cohort

Study drug and medical condition

Medicinal product name

SHINGRIX

ZOSTAVAX

PNEUMOVAX 23

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

CROTALINE ANTIVENIN, POLYVALENT

HERPES ZOSTER NOSODE D12

HERPES ZOSTER VACCINE (RECOMBINANT, ADJUVANTED)

Anatomical Therapeutic Chemical (ATC) code

(J07BK02) zoster, live attenuated

zoster, live attenuated

(J07BK03) zoster, purified antigen

zoster, purified antigen

(J07AL01) pneumococcus, purified polysaccharides antigen

pneumococcus, purified polysaccharides antigen

Medical condition to be studied

Herpes zoster

Dementia

Cognitive disorder

Population studied

Short description of the study population

Inclusion criteria:

Ø Electronic health records available in the Optum® EHR.

Ø Age at exposure >= 50.

Ø For SHINGRIX, SHINGRIX-2D, ZOSTAVAX, PPSV23, HZ single, HZ multiple, HZ treated with AAT, HZ not treated with AAT, Corticosteroids HIGH, Corticosteroids-LOW: Recorded exposure (see Section “Exposure definitions”).

Ø For Not Exposed: Encounter(s) within +/- 3 months of the exposure date of the matched individual.

Age groups

- Adults (46 to < 65 years)
- Elderly (≥ 65 years)
    - Adults (65 to < 75 years)

- Adults (75 to < 85 years)
- Adults (85 years and over)

Estimated number of subjects

10.000.000

Study design details

Setting

The source population consists of more than 100 million individuals with electronic health records available in the Optum® EHR database with start of records in 2007 - including more than 2000 hospitals and 5000 clinics in the United States. The data consists of primarily large integrated delivery networks (IDNs; accounting for ~80% of the data).

Outcomes

Dementia, Vascular dementia, Mild cognitive impairment (MCI), Herpes Zoster

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Data analysis plan

Matched cohorts defined by their exposure to various elective adult immunizations and control conditions will be compared in pairwise fashion. For each comparison pair, the following will be reported:

• Relative risk (RR) between cumulative hazards in the compared cohorts estimated by Nelson-Aalen method at 3- and 5-years post-exposure.

• Statistical significance test results (p-value) of comparing the cumulative hazard distributions between the compared cohorts at 3- and 5-years post-exposure using Chi2 test accounting for censoring (two-sided, alpha = 0.05).

• Pre- and post-matching descriptive cohort statistics covering covariates, outcomes and matching factors.

• Cumulative hazard curves (y-axis: cumulative hazard, x-axis: time) for both

comparison groups estimated by Nelson-Aalen including confidence intervals to enable qualitative analysis.

Documents

Abstract of study report

Clinical Study Report Synopsis Anonymised 31 Jul 2026.pdf (181.88 KB)

Study report

Clinical Study Report Body Anonymised 31 Jul 2026.pdf (10.67 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), other

Optum Electronic Health Records (EHR) database (United States)

Data sources (types)

Electronic healthcare records (EHR)

Other

Data sources (types), other

Routine primary care electronic patient 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