Phenotyping Asthma Exacerbations in primary care: an electronic medical record study (PHASE)

First published: 06/05/2025

Last updated: 30/10/2025

Study Ongoing

Administrative details

EU PAS number

EUPAS1000000566

Study ID

1000000566

DARWIN EU® study

No

Study countries

United Kingdom

Study description

The study is a historical, longitudinal, descriptive cohort study using patients' electronic medical records (EMR) extracted from general practices from the Optimum Patient Care Research Database (OPCRD).

The primary aim of the study is to investigate whether blood eosinophil count (BEC) measured at stable state and/or exacerbation can discriminate between different exacerbation phenotypes and different clinical responses to oral corticosteroid and/or antibiotic treatment at exacerbation in primary care.

The secondary aim of the study is to assess if low-BEC exacerbations predominate in winter, are more likely to be diagnostically labelled as infective by the clinician, and more frequently treated with oral antibiotics.

Study status

Ongoing

Research institutions and networks

Institutions

Nuffield Department of Medicine, University of Oxford

Optimum Patient Care (OPC)

United Kingdom

First published: 01/02/2024

Last updated: 01/02/2024

Institution | Not-for-profit

Contact details

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Primary lead investigator

Imran Howell

Primary lead investigator

Study timelines

Date when funding contract was signed

Planned: 30/05/2025

Study start date

Planned: 07/07/2025

Actual: 28/10/2025

Data analysis start date

Actual: 28/10/2025

Date of final study report

Planned: 07/12/2026

Sources of funding

- Non-for-profit organisation (e.g. charity)

Study protocol

PHASE protocol final 29 04 25.pdf (227.53 KB)

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

Study type:

Non-interventional study

Scope of the study:

Disease epidemiology

Effectiveness study (incl. comparative)

Data collection methods:

Secondary use of data

Study design:

Historical, longitudinal, descriptive cohort study using patients' electronic medical records (EMR) extracted from general practices from the Optimum Patient Care Research Database (OPCRD).

Main study objective:

Determine whether blood eosinophil count (BEC) can discriminate between different clinical responses to oral corticosteroid and/or antibiotic treatment for asthma attacks in primary care.

Study Design

Non-interventional study design

Cohort

Study drug and medical condition

Medical condition to be studied

Asthma

Population studied

Short description of the study population

1. Patients with a EMR diagnosis of asthma.

2. Evidence of active asthma (at least 2 ICS prescriptions in the last 12 months).

3. Treatment of an exacerbation with oral steroids and/or oral antibiotics between 2000 - January 2020.

4. An asthma exacerbation in primary care.

5. BEC recorded in the 12 months prior to the exacerbation date.

6. Continuous electronic medical record data for the 12 months prior to, and at least 90 days following, the exacerbation date.

Age groups

- **In utero**
- **Paediatric Population (< 18 years)**
  - Neonate
    - Preterm newborn infants (0 – 27 days)
    - Term newborn infants (0 – 27 days)
  - Infants and toddlers (28 days – 23 months)
  - Children (2 to < 12 years)
  - Adolescents (12 to < 18 years)
- **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

Electronic medical records (EMR) extracted from general practices from the Optimum Patient Care Research Database (OPCRD).

Comparators

Primary

1. Compare the rates of treatment failure (defined below) at 28 days for asthma exacerbations treated in primary care with oral steroids, or antibiotics, or both between high (>=0.3 x 10^9/L) and low (<0.3 x 10^9/L) blood eosinophil count (BEC) groups at steady state.

Key secondary

1. Compare the rates of treatment failure at 28 days for asthma exacerbations treated in primary care with oral steroids, or antibiotics, or both continuously by BEC at steady state.

Other secondary

1. Compare the rates of treatment failure at 14 days for asthma exacerbations treated in primary care with oral steroids, or antibiotics, or both continuously by BEC at steady state
2. Compare the rates of treatment failure at 14 days for asthma exacerbations treated in primary care with oral steroids, or antibiotics, or both between high (>=0.3 x 10^9/L) and low (<0.3 x 10^9/L) blood eosinophil count (BEC) groups at steady state.
3. Compare the rates of treatment failure at 14 and 28 days for asthma exacerbations treated in primary care with oral steroids, or antibiotics, or both between high (>=0.3 x 10^9/L) and low (<0.3 x 10^9/L) BEC groups on day of exacerbation.
4. Compare the rates of treatment failure at 14 and 28 days for asthma

exacerbations treated in primary care with oral steroids, or antibiotics, or both continuously by BEC on day of exacerbation.
5. Explore the association between time to treatment failure up to 90 days, the continuous BEC value, and other covariates.
6. Characterise asthma exacerbations by BEC on day of exacerbation and examine their relationship with the time of year.
7. Record diagnostic labels used for asthma exacerbations and compare the use of steroids and/or antibiotics, and the rates of treatment failure.

Outcomes

Primary Outcomes

1. Treatment failure at 28 days after exacerbation date, defined as:
i) Acute prescription of oral corticosteroids and/or oral antibiotics in conjunction with an asthma or LRTI related primary care consultation.
ii) Admission to hospital, or emergency department visit, or out of hours healthcare visit, with asthma or LRTI as primary or secondary diagnosis.
2. Highest BEC in the last 12 months.

Secondary Outcomes

1. Treatment failure at 14 days after exacerbation date.
2. Treatment failure at 90 days after exacerbation date.
3. BEC on day of exacerbation.
4. Blood CRP level taken on exacerbation date (if available).
5. Date of exacerbation .
6. Diagnostic label of exacerbation (asthma attack/exacerbation; or LRTI; or other/undocumented).
7. Diagnostic label of pre-existing airways disease (asthma; or asthma/COPD).

Data analysis plan

For the primary outcome, Cox proportional hazards regression analysis will be used to adjust for confounders (age, sex, BMI, FEV1, GINA step, season of exacerbation, co-morbid COPD) to estimate the association between BEC and treatment failure. This will be modelled using the BEC categories listed above. We will also run a recurrent event Cox model and a discrete-time Cox model. Kaplan-Meier curves will be performed with high/low blood BEC as a categorical variable.

For the key secondary analysis of BEC as a continuous variable we will log-transform BEC for the analysis. The Cox models will be represented graphically using a restricted cubic spline association the adjusted treatment failure hazard ratio (outcome variable) and BEC. This analysis will allow exploration of non-linearity and choice of BEC threshold for a future trial.

Data management

Data sources

Data source(s)

Optimum Patient Care Research Database

Data sources (types)

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

Unknown