Assessing asthma attack risk in randomized trials through systematic review of individual participant data: the ORACLE2 project

Record number : OPR-1016

Overview

RESEARCH DIRECTION

Simon Couillard, Professeur - Department of Medicine

INFORMATION

simon.couillard2@usherbrooke.ca

RESEARCH CO-DIRECTION

Yohann Moanahere Chiu, Professeur - Department of Family Medicine

INFORMATION

yohann.chiu@usherbrooke.ca

ADMINISTRATIVE UNIT(S)

Faculté de médecine et des sciences de la santé
Département de médecine
Département de médecine de famille

LEVEL(S)

3e cycle
Stage postdoctoral

LOCATION(S)

Campus de la santé

Project Description

Asthma is a chronic, high-prevalence respiratory disease which, extrapolating from the latest estimates, affects over 400 million people worldwide1.

Overall aim
The overall aim of ORACLE-2 project is to derive a definitive and clinically useful risk scale using individual patient data from all identifiable patients randomised to placebo treatment in clinical trials in whom information on type-2 biomarkers and asthma attack frequency is available. Here, we propose to address a series of more detailed research questions related to prognosis in the available rich data sets.

Preliminary work already done
Individual participant data (IPD) have been collected from the control arms of 22 randomised controlled trials (RCTs) in asthma research. In total, 6516 patients were included. With Initial Data Analysis (IDA), we have prepared these data for statistical analysis. Using multiple imputation by chained equations (MICE), we created multiple imputed datasets with which univariable and multivariable prognostic relations of risk factors at baseline were assessed by another PhD student.

Specific aims for this PhD or Postdoc proposal
We propose further analyses with this rich ORACLE2 dataset, for which an additional, statistically skilled, PhD student (4 years, 1 FTE) or post-doctorate (3 years 1 FTE) is required. Further analyses include the assessment of multivariable prognostic relations of risk factors at baseline, characterisation of type-2 high RCT patient populations across asthma severities, and the prediction of placebo effects. These analyses are described in 3 tasks. The PhD student will work in collaboration with other PhD students working on this project, under the supervision of 1 clinician professor and 1 biostatistician professor.

Task 1: Association studies
Univariable and multivariable models will be built to assess the prognostic relationships of risk factors at baseline with the absolute

number of severe asthma exacerbations that will occur in the following 12 months.
Risk factors requiring specific prognostic studies are as follows:

A) ACQ-5 score/symptom (mean score and/or per questionnaire item)
B) Number and severity of attacks in the preceding 12 months
C) Anthropometry: age, sex, race/ethnicity, BMI
D) Nasal comorbidities: chronic rhinosinusitis, nasal polyposis, history of polypectomy, allergic rhinitis, intranasal corticosteroids.
E) Allergies: eczema reported, allergic rhinitis reported, allergic sensitisation, IgE measured.
F) Behavioural factors: smoking, compliance, psychiatric illness, use of rescue medication.

* The doctoral student will select 3 or 4 of these dimensions for his work.
** Publications in international journals: >=3, grouped by clinical dimension.

Task 2: Descriptive study of participants with type-2 inflammation
We will test the hypothesis that type-2 inflammation is expressed differently across the stages of asthmatic disease. A descriptive analysis of participants with elevated biomarkers (blood eosinophils and FeNO) according to disease severity will be carried out. For this analysis, we will restrict ourselves to randomised clinical studies that did not select participants on the basis of biomarkers. The 4292 participants included will be described and compared according to their stage of severity.
*Publication in an international journal: 1

Task 3: Modelling placebo effects
Using the knowledge gained in tasks 1 and 2, univariable and multivariable models to explore the factors associated with the greatest reduction in asthma attack rates compared with 12 months prior to randomisation to placebo. Specifically, we will test the hypothesis that placebo effects are greater in patient populations with elevated biomarkers.
*Publications in international journals: >= 1

The graduate student will work in the laboratory of Dr Couillard (pulmonologist, MD MSc) et Yohann Moanahere Chiu.

Profil et formation recherchés

- M.Sc. in biostatistics, epidemiology or MD with training in biostatistics, epidemiology, or related sciences.
- Excellent research skills
- Familiarity with R software is an asset
- Experience in database manipulation is an asset
- Interest in asthma treatment and knowledge transfer, including discussions/presentations with clinicians.
- Excellent academic record
- Excellent command of written and spoken English and, ideally, French.
- Ability and willingness to work with international collaborators, including other PhD students.

The requirements must meet those of the PhD in health sciences research .

Submit your application
Applicants must send the required documents to Dr Couillard et Dr Chiu by email at s.couillard@usherbrooke.ca et Yohann.Chiu@USherbrooke.ca

Please provide:
√ Curriculum vitæ
√ Most recent transcripts
√ Cover letter
√ Reference letter (optional for application, but mandatory previous to interview)

Discipline(s) by sector

Funding offered

Yes

Partner(s)

Association Pulmonaire du Québec

Sciences de la santé

Médecine interne, Pneumologie

The last update was on 13 March 2024. The University reserves the right to modify its projects without notice.