Evidence Synthesis Ireland Fellowship Scheme
Review Identification Form

In order to help us advertise your review and select an appropriate fellow, please complete the following:

Review Centre/Group Mentor

Augusto Azuara-Blanco, Queen's University Belfast

Review title

What are the risk factors for glaucoma progression?

Review type

Prognostic review

Review details

Glaucoma is a chronic eye condition that can lead to loss of vision if not identified and treated early. Glaucoma is the leading cause of irreversible blindness worldwide, and the second leading cause of blindness in the developed world. Treatment is effective to prevent blindness. Glaucoma prevalence increases with age. It is expected that the number of people with glaucoma will increase in the future. Those with the condition are typically monitored in hospital eye services. Treatment means having laser treatment and/or using eye drops on a daily and lifelong basis and/or surgery. In 2017, NICE glaucoma guidelines identified 'Risk tools to identify risk of developing chronic open angle glaucoma and risk of sight loss' as a top research recommendation. Our research aims to answer this research priority. This review will be undertaken to gather evidence on prognostic factors for the progression of glaucoma; this information is essential for ophthalmologists and other health professionals for the counselling and management of people with glaucoma and, thus, for patients and their families. Findings will facilitate clinicians in guiding patients and providing more appropriate advice regarding modifiable risk factors, determining in a more personalised manner the interval required for monitoring appointments, and considering early intervention in high-risk groups. This prognostic review may help to identify targets for new interventions that aim to modify the course of the disease. Furthermore, findings may guide the design and analysis of future interventional clinical trials. It is also important to identify areas where further research is required to enhance understanding on disease pathogenesis, risk prediction, prevention, and treatment. To our knowledge, there are currently no systematic reviews specifically on prognostic factors for the progression of glaucoma.

Primary Objective Review Question:

"What prognostic risk factors specifically predict the progression of disease in individuals with glaucoma?"

Table 1. PICOT of the primary objective prognostic factor review question

Population	Male and female adults ≥18 years of age of any ethnicity with open angle glaucoma. The targeted population will consist of adults (≥18 years of age) of any gender with glaucoma, diagnosed as per standard clinical practice. Studies involving participants of all ethnicities, geographical locations and socio-economic status will be eligible for inclusion. Any appropriate studies including a subset of relevant participants will be considered as potentially eligible if data from this subset is been given separately.
Index Prognostic Factors	Broad review of prognostic factors. Studies evaluating potential prognostic factors associated with the progression may be eligible for inclusion.
Comparator	
Outcomes	Progression of glaucoma.
Timing	Studies presenting the above outcome at any time point will be included as it can occur years for glaucoma to progress. We will determine also over what time period the outcomes are predicted by the risk factors investigated
Setting	Studies undertaken in a primary or secondary care setting. No geographical limitations.

Search strategy:

We will conduct an online search of electronic databases; Ovid MEDLINE, Embase, CENTRAL, Cochrane Libraries and ISI Web of Science. We will apply a defined search strategy around three components, "prognostic factors", "progression" and "glaucoma".

Inclusion criteria Eligible study designs will include population-based studies, prospective or retrospective cohort longitudinal studies, as well as Randomised Clinical Trials (RCTs) evaluating treatments to prevent progression of glaucoma.

Exclusion criteria Retrospective cohort studies with less than 500 participants will be excluded

Data extraction:

Data extraction will be undertaken by a masked investigators and validated by the supervisor (AAB). The CHARMS-PF checklist will be utilised to guide data extraction and data will be entered on a pre-piloted data extraction form on Review Manager platform.

Risk of Bias assessment:

The Quality in Prognosis Studies (QUIPS) tool will be utilised to assess the risk of bias of included studies.

Risk of bias will be assessed by two independent reviewers and discrepancies will be arbitrated by a third reviewer.

Each 'Risk of bias' domain will be assessed as low, moderate or high, and descriptions will be provided as to the reasoning for such assessments. We will assess publication bias with the funnel plot and Egger's regression intercept when ten or more studies are included in a meta-analysis.

Statistical analysis

We will conduct meta-analysis (i.e. report a weighted average of the individual study measures of association) in clinically relevant groups using a random effects approach. We will meta-analyse hazard ratios, odds ratios and risk ratios separately for each prognostic factor and outcome. Similarly, unadjusted and adjusted associations will be reported separately. If we determine that conducting a meta-analysis is inappropriate due to heterogeneity, we will report a narrative or tabulated summary. We will use 95% confidence intervals throughout.

We anticipate inter-study heterogeneity relating to three key areas.

1. Clinical heterogeneity including participant demographics, variability in clinical characteristics of the disease (duration, disease severity), the effect of different interventions and co-morbidities in study cohorts. Differences in how outcomes are measured, i.e., how progression is defined.
2. Methodological heterogeneity generated from different study designs, sample sizes and how effectively studies are conducted with regard to risk of bias and approach to analysis.
3. Statistical heterogeneity arising from different estimates of prognostic effect for each factor of interest.

The effects of these aspects of heterogeneity will be accounted for, if a meta-analysis is conducted.

Review current status

Not started

Any specific/desirable requirements for fellow (e.g. clinical expertise, methodological expertise)

n/a

Estimated start and completion dates

August 2021-July 2022