The impact of Leber's Heredity Optic Neuropathy (LHON) on quality of life (QoL): a systematic literature review

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SUMMARY

OBJECTIVES

- LHON is a rare, autosomal dominant, genetic disorder which causes severe vision loss or blindness, with an average onset between 10-30 years.
- The most common symptoms of LHON are vision loss and reduced visual acuity, often in both eyes.
- There is currently no cure, although some treatments are able to slow or halt the progression of the disease.
- This systematic literature review (SLR) was conducted to gather further insight into how QoL is measured in LOHN, and the impacts of LOHN on patients' QoL.

METHODS

- We conducted a targeted literature review of PROs reported in LHON patients up to 06 June 2023.
- Embase, MEDLINE, Econlit, and EBMR (Cochrane) databases were searched for terms related to LHON, and PRO and quality-of-life data.
- Identified articles were assessed for inclusion by a single reviewer based on title and abstract screening, and subsequently full text screening.
- Data were extracted from included studies, regarding the QOL burden imposed by LHON on patients.

FINDINGS

- 30 papers were identified from the initial search. Following abstract and full paper review, 9 papers concerning 5 studies were included: 1 study regarding the potential therapy Idebenone and 2 studies regarding lenadogene nolparvovec, a gene therapy.
- The papers identified a variety of disease-related QoL burdens, including impacts on daily living, assistance, interpersonal relationships, career/finances, mental health/wellbeing.
- The impact LHON has on QoL reaches across all aspects of daily life, emphasising the importance of developing new therapies in this area.

BACKGROUND & AIMS

- LHON is a rare, autosomal dominant, genetic disorder which causes severe vision loss or blindness, with an average onset between 10-30 years.
- The most common symptoms of LHON are vision loss and reduced visual acuity, often in both eyes.
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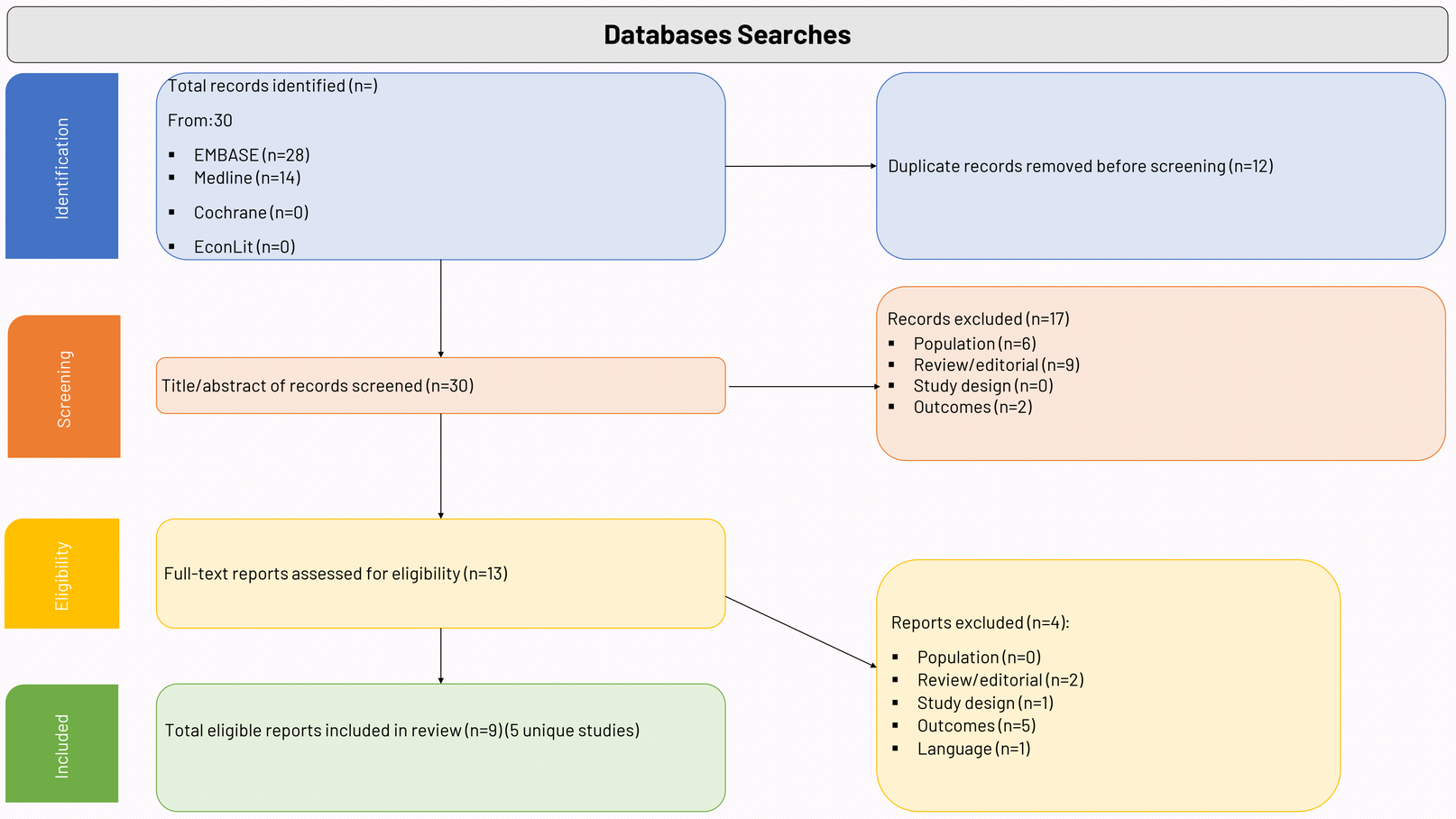
Figure 1. PRISMA.



RESULTS

- 30 papers were identified from the initial search. Following abstract and full paper review, 9 papers concerning 5 studies were included: 1 study regarding the potential therapy Idebenone and 2 studies regarding lenadogene nolparvovec, a gene therapy.
- The papers identified a variety of disease-related QoL burdens, including impacts on daily living, assistance, interpersonal relationships, career/finances, mental health/wellbeing.
- Management of risk factors that are considered as triggers to disease (smoking/alcohol intake) were also highlighted.
- Impacts on QoL were not limited to those with sight loss, extending additionally to families and asymptomatic carriers.
- It was also found that patients who were newly diagnosed, or diagnosed later in life, suffered the greatest QoL burden.
- The QoL measures reported were VF-14, visual function questionnaire-25 (VFQ-25), energy levels evaluated via self-reported VAS scale, and depression scores using the Beck Depression Inventory (BDI-I). Each, although established QoL measures, lack specificity to LHON.

- The results of this systematic review suggest that LHON has a profound and multifaceted impact on the QoL of those affected. Central themes include:
  - **Vision-Specific Impairments**: LHON significantly impairs visual function, affecting daily activities such as reading, recognizing faces, and navigating the environment. The loss of central vision and color vision deficits contribute to a decline in independence and overall QoL.
  - **Psychosocial Consequences**: Individuals with LHON often report psychosocial challenges, including feelings of frustration, isolation, depression, and reduced self-esteem. The adjustment to a life with vision loss is accompanied by significant emotional burdens.
  - **Social and Occupational Limitations**: LHON can lead to limitations in social activities and occupational functioning. Reduced ability to participate in work and social life can further hinder QoL.
  - **Resilience and Coping**: Some individuals with LHON exhibit resilience and adaptability, developing coping strategies and seeking support from the LHON community and healthcare providers to mitigate the emotional and social challenges.

CONCLUSIONS

- There is limited published literature relating to LHON and QoL, and no QoL measure specifically tailored to LHON.
- The impact LHON has on QoL reaches across all aspects of daily life, emphasising the importance of developing new therapies in this area.
- Areas of impact that is often missed in QoL measures for LHON include:
  - Adaptation / Adjustment to daily living
  - Assistance / Difficulty with day to day tasks (reading is highlighted as greatest difficulty on VF-14 score)
  - Emotional impact / impact on relationships/relatives/carers
  - Work – limited opportunities / progression / prospects / uncertainty
  - Finances – impacted by work impact and available benefits/ costs of low vision aids. Idebenone costly and not widely available
  - Mental fatigue – permanent attention and vigilance
  - Safety – trips falls scolds risk of injury, traffic safety
- Further work is required to fully report the QoL in LHON, and tailored instruments may be required to give a more accurate picture

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