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From Sight to Life: The Effect of Anti-VEGF Treatment on Vision-Related Quality of Life in Diabetic Retinopathy – A Systematic Review and Meta-Analysis

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ADMINISTRATIVE INFORMATION

Support - Not Applicable.**Review Stage at time of this submission** - Preliminary searches.**Conflicts of interest** - None declared.**INPLASY registration number:** INPLASY202570061**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 15 July 2025 and was last updated on 15 July 2025.

INTRODUCTION

Review question / Objective In patients with diabetic retinopathy, how does treatment with anti-vascular endothelial growth factor (anti-VEGF) affect vision-related quality of life compared to other therapeutic interventions?

Rationale While anti-vascular endothelial growth factor (anti-VEGF) injections are widely used in the treatment of diabetic retinopathy, their impact on vision-related quality of life (VR-QoL) remains underexplored in the context of a meta-analysis. To date, no comprehensive synthesis of evidence has systematically evaluated the effects of anti-VEGF therapy on VR-QoL outcomes in this patient population.

Condition being studied Diabetic retinopathy (DR) is a progressive microvascular complication of diabetes mellitus and a leading cause of vision impairment and blindness worldwide. The condition arises from prolonged hyperglycemia,

which damages the retinal vasculature and can lead to diabetic macular edema (DME) and proliferative diabetic retinopathy (PDR). These complications significantly impact not only visual function but also overall quality of life.

Anti-vascular endothelial growth factor (anti-VEGF) agents are widely used as first-line treatments for vision-threatening DR and DME. These intravitreal injections have been shown to improve anatomical and visual outcomes. However, their effect on vision-related quality of life (VR-QoL), a crucial patient-centered outcome, remains less clearly defined.

To date, there has been no comprehensive meta-analysis assessing the impact of anti-VEGF therapy on VR-QoL in patients with diabetic retinopathy. This systematic review and meta-analysis aims to fill that gap by synthesizing available evidence on how anti-VEGF treatments influence VR-QoL compared to other therapeutic interventions.

METHODS

Search strategy A comprehensive and systematic literature search will be conducted to identify studies that evaluate the effect of anti-vascular endothelial growth factor (anti-VEGF) therapies on vision-related quality of life (VR-QoL) in patients with diabetic retinopathy.

Search Terms: diabetic retinopathy AND ("aflibercept" OR "ranibizumab" OR "bevacizumab" OR "pegaptanib" OR "anti VEGF" OR "anti VEGFs" OR "anti-Vascular endothelial growth factor") AND (National Eye Institute Visual Function Questionnaire 25 OR Visual Function Questionnaire OR NEI-VFQ-25 OR quality of life)

Databases: Embase via Ovid, PubMed, Scopus, Science Direct, Web of Science.

Participant or population Adults with diabetic retinopathy.

Intervention Anti-VEGF injections.

Comparator The comparators will include alternative treatments to anti-vascular endothelial growth factor (anti-VEGF) injections for diabetic retinopathy, such as laser photocoagulation, intravitreal corticosteroids, vitrectomy, observation, or placebo/sham treatments.

Study designs to be included All study types will be included primarily randomized controlled study designs.

Eligibility criteria Study Types: We will include randomized controlled trials, cohort studies, and case-control studies reporting on vision-related quality of life (VR-QoL) in patients with diabetic retinopathy treated with anti-VEGF injections. Only full-text, peer-reviewed articles published in English will be considered. Reviews, case reports, editorials, and animal studies will be excluded. Participants: Adults (≥ 18 years) diagnosed with diabetic retinopathy (with or without macular edema). Intervention: Intravitreal anti-vascular endothelial growth factor (anti-VEGF) therapy (e.g., ranibizumab, aflibercept, bevacizumab, brolucizumab). Comparators: Other treatments (e.g., laser photocoagulation, corticosteroids, observation), or pre-treatment baseline in the same patients. Outcomes: Primary: Vision-related quality of life measured using validated instruments (e.g., NEI VFQ-25, IVI). Secondary: Visual acuity and other patient-reported outcomes if available. Randomized controlled trials (RCTs) published in English language with NEI-VFQ-25 data available which looked at anti-veg therapy for diabetic retinopathy.

Information sources Electronic databases (Embase, PubMed, Scopus, Science Direct, Web of Science) and contact with authors.

Main outcome(s) The primary outcome is vision-related quality of life (VR-QoL) in patients with diabetic retinopathy receiving anti-vascular endothelial growth factor (anti-VEGF) therapy, as measured by validated patient-reported outcome instruments such as the National Eye Institute Visual Function Questionnaire-25 (NEI VFQ-25) and the Impact of Vision Impairment (IVI) questionnaire. Comparisons will be made against alternative treatments or baseline values.

Additional outcome(s) Secondary outcomes will include changes in best-corrected visual acuity (BCVA), central retinal thickness (CRT), treatment frequency, and incidence of adverse events. These outcomes will help contextualize the impact of anti-vascular endothelial growth factor (anti-VEGF) therapy on vision-related quality of life in patients with diabetic retinopathy. Best-corrected visual acuity, treatment complications.

Data management All retrieved references will be imported into EndNote for de-duplication and initial screening. Screening of titles, abstracts, and full texts will be independently conducted by two reviewers. Discrepancies will be resolved by consensus or consultation with a third reviewer. Data extraction will be carried out using a standardized form developed in Microsoft Excel or Word, capturing study characteristics, participant details, interventions, comparators, outcome measures (specifically vision-related quality of life), and results. Extracted data will be cross-verified by a second reviewer for accuracy. All data will be securely stored on password-protected institutional servers.

Quality assessment / Risk of bias analysis Risk of bias will be assessed using The Joanna Briggs Institute (JBI) Critical Appraisal Tools.

Strategy of data synthesis Demographic characteristics will be summarized using descriptive statistics. Continuous variables will be reported as means \pm standard deviations, while categorical variables will be presented as frequencies and percentages.

Subgroup analysis Subgroup analyses may be conducted based on factors such as type of anti-VEGF agent, duration of follow-up, or baseline severity of diabetic retinopathy.

Sensitivity analysis Sensitivity analyses will be considered if substantial heterogeneity is detected or if the quality of included studies varies significantly. The need for and scope of sensitivity analysis will be determined based on the characteristics of the extracted data during the review process.

Language restriction English Language only.

Country(ies) involved United States.

Keywords Diabetic Retinopathy; Anti-vascular endothelial growth factors; Quality of Life.

Dissemination plans A paper will be published in the leading journal.

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