

please peer review this manuscript for a reputable periodic, insert date of review

**ChatGPT said:**

### **Peer Review Report**

**Manuscript Title:** *Retinal Nerve Fibre Layer Thinning and Ganglion Cell Complex Degeneration in Parkinson's Disease: Emerging Biomarkers for Neurodegeneration and Cognitive Decline*

**Author:** Richard Murdoch Montgomery

**Journal:** *Scottish Science Society*

**Date of Review:** 28 June 2025

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## **1. Summary**

This manuscript presents a comprehensive and timely review of retinal structural changes in Parkinson's Disease (PD), focusing on RNFL and ganglion cell-inner plexiform layer (GCIPL) thinning as potential biomarkers for neurodegeneration and cognitive decline. It synthesises high-quality evidence from recent studies, including meta-analyses and longitudinal imaging studies using OCT (optical coherence tomography), and discusses the clinical significance, diagnostic value, and challenges of retinal biomarkers.

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## **2. Strengths**

### **a) Relevance and Originality**

- The topic is highly relevant to both neurology and ophthalmology, intersecting emerging biomarker discovery with established imaging modalities.
- The article fills an important translational niche between neurodegenerative disease progression and ophthalmic imaging.

### **b) Comprehensive Literature Integration**

- The literature review is thorough, up-to-date, and well-structured. It draws upon key references, including major studies (e.g., Chrysou & Jansonius, 2019; Murueta-Goyena et al., 2024) and foundational works in PD neuropathology (e.g., Braak staging).
- Figures (e.g., page 6 and 11) are clearly annotated and enhance the understanding of anatomical and statistical findings.

### **c) Clinical Impact**

- The discussion of RNFL/GCIPL changes as early, non-invasive, and scalable biomarkers addresses a significant clinical need for earlier PD diagnosis and stratification of cognitive decline risk.
- The section on OCT segmentation challenges, heterogeneity in protocols, and need for cross-platform calibration is well noted.

#### **d) Writing Style and Structure**

- The prose is scholarly, fluent, and maintains a consistent British academic tone.
  - Section transitions are clear, and subheadings (e.g., "Advantages of Retinal Biomarkers in PD") are helpful for thematic orientation.
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### **3. Weaknesses and Suggestions for Improvement**

#### **a) Methodology Section (pp. 6–8)**

- **Issue:** The methodology is somewhat descriptive and lacks detail on inclusion/exclusion criteria for cited studies, search strategy (if systematic), and meta-analytic logic.
- **Suggestion:** Recast this section more formally as a structured methodology, if intended as a systematic or scoping review. Explicitly state the databases searched, keywords used, inclusion criteria, and number of articles reviewed.

#### **b) Visual Hallucination Discussion (pp. 5–6)**

- **Issue:** The paragraph on hallucinations presents contradictory findings without adequate critical synthesis.
- **Suggestion:** Provide a clearer evaluation of conflicting results and explain how confounders (e.g., medication use, disease stage) may influence correlations with retinal findings.

#### **c) Lack of Tabular Summary**

- **Issue:** Although rich in detail, the manuscript would benefit from a **summary table** listing key OCT findings across major studies (author/year, n, quadrant affected, RNFL/GCIPL changes, cognitive correlation).
- **Suggestion:** Add a concise evidence table to aid clinical readers and researchers comparing diagnostic yield.

#### **d) Statistical Interpretation**

- The effect sizes and confidence intervals are rarely mentioned when reporting key findings (e.g., Figure 3).
- Incorporate summary statistics, especially in comparative claims, and discuss diagnostic thresholds or cut-offs where available.

#### **e) Figure Quality**

- Figures are informative but could be improved in presentation quality and resolution. Figure 2 (page 9–10) is especially cluttered and not easily interpretable.
- Suggest re-rendering Figure 2 into a clearer flow diagram using a formal graphical editor.

#### **f) Formatting Inconsistencies**

- The section titles “1.2 Clinical Significance...” and “3.2 Advantages...” break continuity and could confuse readers due to inconsistent hierarchy.
- Suggest using either purely numbered or thematic section headings throughout.

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## **4. Recommendation**

### **Decision:** *Minor Revisions*

The manuscript is of high quality and should be accepted for publication after the minor revisions suggested above. It offers an important contribution to the field of neurodegeneration and supports a rapidly growing body of interdisciplinary research on retinal biomarkers in systemic diseases.