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CENTRAL SEROUS CHORIORETINOPATHY TREATMENT SUB THRESHOLD LASER VS PHOTODYNAMIC THERAPY

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The objective of this study was to compare the efficacy and safety of subthreshold micropulse laser (SLT) versus half-dose photodynamic therapy (PDT) in the treatment of chronic central serous chorioretinopathy (cCSC). The study assessed subretinal fluid (SRF) resolution, improvement in best-corrected visual acuity (BCVA), and anatomical retinal changes. The aim was to determine which of the two treatments provides better functional and structural outcomes in the short and long term, while also considering the potential adverse effects associated with each technique.

This study employed a scoping review to compare the efficacy and safety of subthreshold micropulse laser (SLT) and half-dose photodynamic therapy (PDT) for chronic central serous chorioretinopathy (cCSC). A systematic search was conducted in PubMed, Embase, Cochrane, and Scopus using terms such as "Central serous chorioretinopathy," "subthreshold laser," and "photodynamic therapy," focusing on clinical studies published between 2000 and 2025. Inclusion criteria included patients with chronic cCSC who had received either SLT or PDT, evaluating SRF resolution, BCVA improvement, and anatomical changes, while excluding acute cases or combined therapies. Extracted data (such as SRF resolution percentage, BCVA changes, and adverse effects) were organized into comparative tables and analyzed qualitatively. Validation included peer review and consultation with retinal experts to ensure methodological robustness.

The PDT demonstrated a higher rate of complete SRF resolution (75% vs. 45% at six months) and a significant improvement in BCVA (gain of +8 letters vs. +4 letters in the laser group). Additionally, PDT resulted in a more pronounced reduction in choroidal thickness ($p < 0.05$). However, subthreshold laser proved to be less invasive, with a lower risk of choroidal atrophy and good efficacy in selected cases. There were no significant differences in severe adverse effects reported between the two groups.

The comparison between subthreshold laser treatment and photodynamic therapy (PDT) for chronic central serous chorioretinopathy (cCSC) has been the subject of various studies. According to the PLACE trial, half-dose PDT is superior to high-density subthreshold micropulse laser in terms of complete subretinal fluid (SRF) resolution and functional improvement.[1] In this study, PDT achieved a higher proportion of patients with complete SRF resolution, along with significant improvements in best-corrected visual acuity (BCVA) and retinal sensitivity compared to subthreshold laser.

Conversely, a study published in Graefe's Archive for Clinical and Experimental Ophthalmology suggests that although PDT may lead to faster SRF resolution, subthreshold laser is less invasive and could serve as an effective alternative to PDT.[2] This study found no significant differences in best-corrected visual acuity or other anatomical parameters between the two treatments at six months, except for a more substantial reduction in subfoveal choroidal thickness in the PDT group.

A systematic review with meta-analysis also indicates that PDT is superior to subthreshold laser in SRF resolution and visual acuity improvement, though subthreshold laser remains a viable alternative. Nevertheless, PDT continues to be the most effective treatment for cCSC, especially in cases requiring rapid SRF resolution.

Conclusions

The comparison between subthreshold laser and photodynamic therapy has not been equally fair on both sides. This happens because PDT has been extensively studied and optimized, while subthreshold laser is still undergoing progressive refinement.

Current evidence indicates that half-dose PDT is superior to subthreshold laser in terms of anatomical resolution and visual recovery in patients with chronic cCSC, particularly in cases with greater SRF accumulation.

However, subthreshold laser remains a developing, cost-effective alternative that allows for treatment personalization and is continuously improving. Enhancements include standardization of treatment patterns, such as refining grid spacing to maximize precision and applying the titration concept to enable safe macular application while allowing for repeated treatment until complete lesion resolution. Advancements in this technique have not been widely communicated or applied, as they are still under development and require further randomized controlled trials (RCTs) to ensure an equitable comparison between the two treatments. These studies are essential for providing patients with lower access to advanced technology the opportunity for improved outcomes.

In summary, the evidence suggests that half-dose PDT is generally more effective than subthreshold laser for SRF resolution and functional improvement in cCSC. However, subthreshold laser remains a less invasive and potentially effective option in selected cases.

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