INPLASY PROTOCOL

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None declared.

The efficacy and safety of micropulse transscleral cyclophotocoagulation in the treatment of glaucoma: a systematic review and meta-analysis

Ling, QY[1]; Zhang, XY[2]; Duan, XC[3].

Review question / Objective: **To assess the efficacy and safety of micropulse transscleral cyclophotocoagulation for glaucoma.**
Condition being studied: **Glaucoma is an irreversible blinding optic neuropathy related to elevated intraocular pressure (IOP), which seriously endangers the visual function worldwide. IOP-lowering treatment is the crucial procedure for glaucomatous patients. Transscleral cyclophotocoagulation can reduce aqueous humor production, thereby reducing IOP and protecting the optic nerve. The commonly applied diode laser cyclophotocoagulation includes micropulse transscleral cyclophotocoagulation (MP-TSCPC) and continuous wave transscleral cyclophotocoagulation (CW-TSCPC). In traditional treatment, CW-TSCPC is regarded as the last resort for refractory glaucoma even following various anti-glaucoma medications, laser therapy and other surgical treatments. However, the severe complications (worsen of visual acuity, hypotony, and inflammation) in CW-TSCPC limit its clinical applications. MP-TSCPC has been gradually developed into a new alternative surgical modality, with relatively less complications while achieving a satisfactory efficacy. Most importantly, it expands the indications of cyclophotocoagulation, no longer just only for end-stage glaucoma. However, the efficacy and safety of MP-TSCPC are variable within different studies and have not yet been studied systematically.**

INPLASY registration number: This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 28 September 2022 and was last updated on 28 September 2022 (registration number INPLASY202290120).

INTRODUCTION

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METHODS

Participant or population: All types of glaucoma at various stage.

Intervention: Micropulse transscleral cyclophotocoagulation.

Comparator: Continuous wave transscleral cyclophotocoagulation.

Study designs to be included: All study types except case reports or reviews (e.g. randomized controlled trials retrospective or prospective cohort studies, and case-control studies)

Eligibility criteria: a) All study types except case reports or reviews (e.g. randomized controlled trials retrospective or prospective cohort studies, and case-control studies);b) A comparative research of micropulse transscleral cyclophotocoagulation and other cyclodestructive procedure;c) Research subject: all kinds of glaucoma;d) Research content: the efficacy and safety of micropulse transscleral cyclophoto-coagulation; e) Without gender, race, age, and surgical history restrictions;f) Without the laser energy and duration restrictions.

Information sources: electronic databases, including PubMed, EMBASE, and the Cochrane Library of Systematic Reviews

Main outcome(s): Therapeutic efficacy included IOP reduction (IOPR) and the reduction in the number of the anti-glaucoma medication (NOAMR) from the baseline to endpoints at various follow-up visits, as well as retreatment rate. The therapeutic safety was evaluated by the complication including hypotony, phtisis bulbi, scleral thinning, worsening of visual acuity, pain after laser, and prolonged inflammation.

Quality assessment / Risk of bias analysis: Two review authors working independently will assess the risk of bias in included studies to assess the risk of bias and assign judgements of this for included studies.

Strategy of data synthesis: Continuous outcomes (IOPR and NOAMR) were expressed as weighted mean difference (WMD), while dichotomous outcomes (retreatment rate and complication) were expressed as odds ratios (OR). I2 test was for the magnitude of heterogeneity between publications and the Cochran Q test was for the heterogeneity between publications. Heterogeneity grades were defined as high (I2 > 75%), moderate (75% > I2 > 25%), and mild (I2 < 25%). When I2 < 50% or p < 0.1, the fixed-effect model was chosen, otherwise, the random-effects model was suitable.

Subgroup analysis: We will perform the following subgroup by study type.

Sensitivity analysis: The number of included studies limited the sensitivity analysis and publication bias evaluation.

Country(ies) involved: China.

Keywords: micropulse transscleral cyclophotocoagulation, continuous wave transscleral cyclophotocoagulation, glaucoma, efficacy, safety, meta-analysis.

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