



Outcomes of Micropulse Versus Continuous-Wave Transscleral Cyclophotocoagulation: A Systematic Review and Meta-Analysis

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1. INTRODUCTION

- Glaucoma refractory to medical therapy may require cyclodestructive procedures
- Continuous-wave TSCPC (CW-TSCPC) is effective but associated with collateral tissue damage
- Micropulse TSCPC (M-TSCPC) delivers laser energy intermittently, potentially improving safety
- Comparative effectiveness between modalities remains uncertain
- Objective:** To compare outcomes of M-TSCPC vs CW-TSCPC in uncontrolled glaucoma

2. METHODS

- Systematic review of MEDLINE, EMBASE, EMCARE, CINAHL, PubMed, Cochrane
- PRISMA-guided methodology
- Included: RCTs + comparative observational studies
- Outcomes:
 - Primary:** Treatment success, IOP (3 & 12 months)
 - Secondary:** Medications, retreatment
- Meta-analysis: Random-effects models
- Risk of bias: ROBINS-I

3. RESULTS

- Five studies included, comprising 663 eyes
- No significant difference in:
 - Treatment success** (OR 1.13, p=0.48)
 - IOP reduction (3 & 12 months)**
 - Medication burden**
- Retreatment rates (including repeat TSCPC or surgery) significantly lower with M-TSCPC:** OR 0.45, p=0.0009

KEY FINDINGS
M-TSCPC significantly reduces retreatment rates
Both techniques demonstrate comparable IOP control and success rates

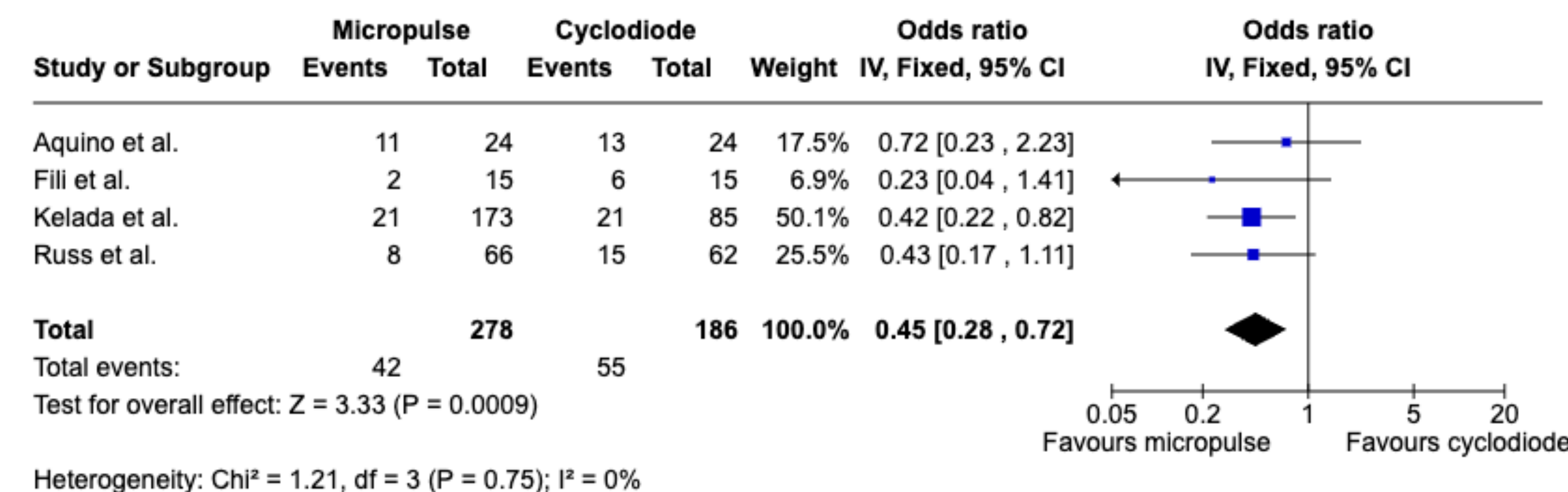


Figure 1. Forest plot demonstrating a significantly lower likelihood of retreatment following M-TSCPC compared with CW-TSCPC.

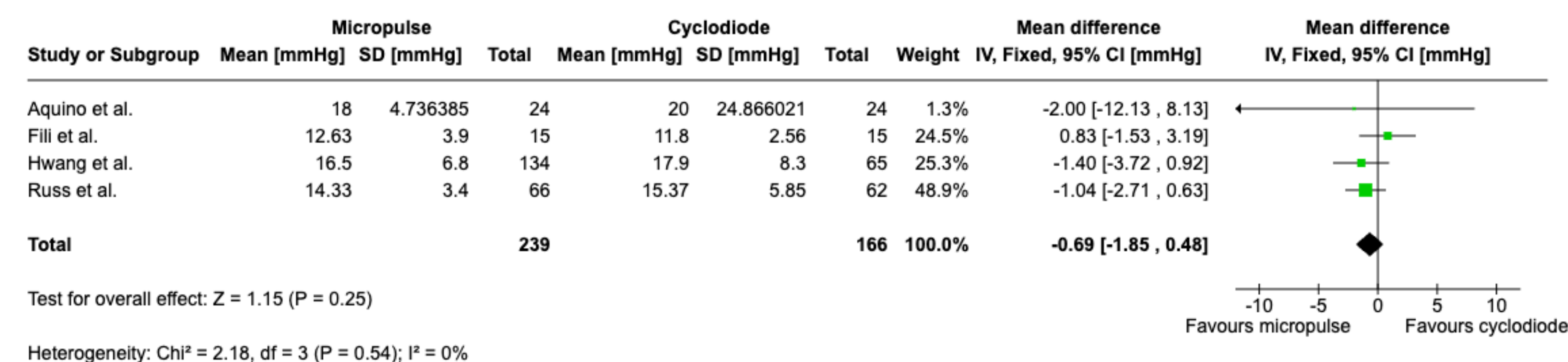


Figure 2. Forest plot demonstrating no significant difference in mean intraocular pressure at 12 months between M-TSCPC and CW-TSCPC.

4. CONCLUSION

- M-TSCPC is associated with significantly lower rates of additional glaucoma interventions, with comparable treatment success and IOP reduction
- Safety outcomes were variably reported but suggest fewer complications with M-TSCPC
- Further large, standardised longer term trials are required to look at comparative retreatment rates

5. CLINICAL RELEVANCE

- M-TSCPC may reduce need for further glaucoma interventions
- Comparable efficacy supports use as an alternative to CW-TSCPC
- M-TSCPC may be preferable in earlier or less advanced disease
- Treatment choice should consider patient and disease factors

6. REFERENCES

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