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Three-Year Retrospective Study of Treatment with Micropulse Cyclophotocoagulation as a Primary Procedure for Neovascular Glaucoma

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Purpose

Micropulse cyclophotocoagulation (MP-CPC) is a new procedure for lowering intraocular pressure. It offers a lower inflammatory alternative to continuous-wave cyclophotocoagulation (CW-CPC) which lowers intraocular pressure (IOP) by thermally destroying the ciliary body. MP-CPC achieves less cellular damage by chopping up the energy being delivered so that there is not enough time to travel to surrounding tissues. The exact mechanism of MP-CPC is unclear. The favorable efficacy and side effect profile of MP-CPC has been well studied in primary open angle glaucoma (POAG) but there is much less data available looking into the safety and efficacy in secondary glaucomas; especially neovascular glaucoma (NVG). In this study, we retrospectively analyze the efficacy and safety of MP-CPC as a primary procedure in the treatment of NVG in an inner city hospital setting. Our primary outcomes are intraocular pressure (IOP), repeat IOP-lowering procedures, and adverse events.

Methods

A retrospective chart review was performed following 15 patients at Stroger Hospital of Cook County (Chicago, IL) from 2015 to 2018 with uncontrolled NVG that underwent a MP-CPC as a primary procedure. MP-CPC was determined necessary by a failed IOP goal on maximally tolerated medical treatment. The IOP values were recorded before the procedure and at 1 month, 3 months, 6 months, and 1-year post procedure. Confidence intervals (95%) were calculated for each interval. An unequal variance two-tailed t-test was conducted for each interval after the procedure and compared to the pre-op value. Adverse events and the need for a repeat IOP-lowering procedure were also recorded.

Results

MP-CPC adequately lowered IOP in 8 out of 15 patients (Table 1). A repeat MP-CPC procedure was performed in 5 out of 7 patients with uncontrolled IOP (Table 2). IOP was deemed well-controlled (IOP <17mmHg, >6mmHg) in 3 out of these 5 patients. No adverse events were found in any patient with a primary or repeat MP-CPC.

Conclusions

MP-CPC is a procedure that can successfully lower IOP as a primary procedure in NVG patients. Although an eventual repeat IOP lowering procedure may be necessary, the efficacy and safety of a repeat procedure makes it a very useful tool in the treatment of glaucoma.

Layman Abstract (optional): Provide a 50-200 word description of your work that non-scientists can understand. Describe the big picture and the implications of your findings, not the study itself and the associated details.

Time (months)	Sample Size	Initial MP-COC Average (MP from ug)	95% Confidence Interval Upper Limit	95% Confidence Interval Lower Limit	p<0.05?
0 months	28	20	28.0	12.0	Yes
1 month	31	13.1	21.2	5.0	Yes
3 months	31	18.8	26.2	11.5	Yes
6 months	6	15.2	28.0	2.4	No
12 months	1	19.0	29.0	9.0	No

Time (months)	Sample Size	Report MP-COC Average (MP from ug)	95% Confidence Interval Upper Limit	95% Confidence Interval Lower Limit	p<0.05?
0 months	5	26.2	30.4	22.0	Yes
1 month	6	16.8	21.1	12.5	Yes
2 months	2	16.8	22.2	10.2	No
6 months	5	20	24.9	15.1	Yes

