LASER TREATMENT IN GLAUCOMA

Efficacy and Safety

Erika Rasmuson

Akademisk avhandling

som med vederbörligt tillstånd av Rektor vid Umeå universitet för avläggande av medicine doktorsexamen framläggs till offentligt förvar i Umeälven, målpunkt ZA-21, Psykiatrihuset, Norrlands universitets sjukhus, fredagen den 21 april, kl. 09:00. 
Via länk: https://umu.zoom.us/j/68012936588
Avhandlingen kommer att förvaras på svenska.

Fakultetsopponent: Docent Mika Harju, Faculty of Medicine, Helsinki University, Finland.

Department of Clinical Sciences, Ophthalmology
Glaucoma is a progressive optic neuropathy and the major cause of irreversible blindness worldwide. The most important risk factor for development and progression of glaucoma is an elevated intraocular pressure (IOP), and current treatment aims to reduce the IOP by topical drops, laser therapy or surgery. Although laser therapy has long been used to reduce the IOP, knowledge gaps remain. In this thesis the efficacy and safety, in both a short- and long-term perspective, of laser trabeculoplasty (LTP) and transscleral cyclophotocoagulation (TCP), was evaluated.

The long-term efficacy and safety of TCP was evaluated in 300 eyes of 300 glaucoma patients in northern Sweden. We found an IOP reduction of more than 10 mmHg that was maintained at least 2 years. No severe complications were reported, but a difficult to assess decline in visual acuity (VA) was noted during follow-up.

The short-term effect of TCP was further investigated in 58 eyes of 58 glaucoma patients. The IOP was measured before TCP and at five additional time-points up to 24 hours after TCP. The results showed a transient IOP spike with a peak at six hours after TCP in approximately 40% of the eyes, more commonly in eyes with pseudoexfoliation glaucoma (PEXG).

The short- and long-term efficacy of LTP were studied in 152 eyes of newly diagnosed glaucoma patients that received three different IOP-lowering substances followed by LTP. We showed an additional IOP-lowering effect of LTP and a higher IOP pre-LTP yielded a greater IOP reduction. Eyes with pre-laser IOP ≥15 mmHg showed a significant long-lasting IOP reduction while eyes with pre-LTP IOP <15 mmHg had a limited effect of LTP.

In summary, the efficacy of TCP was overall high in absence of severe complications. The risk of postoperative IOP spikes supports the use of additional IOP-lowering treatment during the first 24 hours. Finally, LTP may provide a long-lasting IOP-lowering effect despite medical multi-treatment in eyes with a pre-LTP IOP ≥15 mmHg.

Keywords
glaucoma, laser treatment, TCP, LTP, ALT, SLT, intraocular pressure, pseudoexfoliation glaucoma, prospective study