

## ABSTRACT

**Background:** glaucoma represents a group of functional eye disturbances causing optic nerve cells destruction that leads to progressive visual dysfunction such as narrowed eye field and decreased in visual acuity. One of the primary risk factor in glaucoma is high intraocular pressure (IOP). On the treatment of primary angle-closure glaucoma, laser peripheral iridotomy become first choice in decreasing the IOP. But in doing so, it may cause post-treatment rise in IOP in some patients. These should be screened and treated early in order to avoid progressive complications. Thus, this study is conducted to see how much the IOP rise 1 hour post-laser in patients with primary angle-closure glaucoma in Yogyakarta is and to see whether the laser energy have a linear association with the elevated IOP. Therefore, the author hope that this study can be used as future references for ophthalmologists in doing the glaucoma treatment.

**Objective:** to identify the immediate intraocular pressure changes after laser peripheral iridotomy is done in patient with primary angle-closure glaucoma in Yogyakarta and to see the association between the laser energy and elevated IOP.

**Method:** Selection of research subjects were using consecutive sampling method. The diagnosis of PACS and CACG was done by residents then confirmed by specialists in Glaucoma sub-division of Ophthalmology Department, Dr. Sardjito Hospital. Patients had been given an explanation about the research and the informed consent sheet before the baseline IOP was recorded. The baseline IOP was recorded using the non-contact tonometer by residents of Glaucoma sub-division of Dr. Sardjito Hospital Yogyakarta before the Nd:YAG LPI procedure was conducted. All diagnosed eyes were given 2% pilocarpine eyedrop 30 minutes prior to laser procedure. Post-laser IOP then measured 1 hour after procedure. The baseline IOP, 1 hour post-laser IOP, and laser energy then noted in Microsoft Excel and were analyzed using SPSS program.

**Results:** Total of 46 eyes from 39 patients that fullfilled the inclusion and exclusion criteria were obtained. 16 eyes were diagnosed as PACS (35%) and 30 eyes were CACG (65%). The average baseline IOP recorded on all diagnosed patients were  $15,348 \pm 3,78$  mmHg while the average 1 hour post-laser IOP were  $18,361 \pm 3,56$  mmHg (95% CI, -3,68;-2,35). Significant differences as much as  $3,013 \pm 2,25$  were noted ( $p < 0,001$ ). The  $p$  value obtained from the Chi Square analysis between laser energy and IOP rise were  $> 0,05$  with relative risk 1,47 (95% CI, [0,95-2,28]).

**Conclusion:** There is a significant IOP rise in eyes with PACS and CACG on 1 hour post Nd:YAG LPI procedure. No significant association was noted between laser energy and IOP rise.

**Keywords:** Intraocular Pressure, Intraocular Pressure, Nd: YAG, Laser Peripheral Iridotomy, Primary Angle-Closure Glaucoma

## INTISARI

**Latar Belakang:** Glaukoma merupakan sekelompok penyakit yang dicirikan oleh gangguan fungsional pada saraf optik di mata yang dapat berkembang menjadi disfungsi pengelihatan progresif dengan manifestasi penyempitan lapang pandang dan turunnya ketajaman pengelihatan. Faktor risiko primer terjadinya glaukoma adalah tekanan intraokuler (TIO) tinggi. Laser iridotomi perifer (LIP) merupakan pilihan utama dalam penanganan glaukoma sudut tertutup primer (PACG) dengan cara menurunkan TIO. Namun, pada beberapa pasien dapat ditemukan peningkatan TIO pos-terapi. Peningkatan ini perlu diamati dan diobati segera untuk menghindari terjadinya komplikasi. Penelitian ini menilai seberapa besar peningkatan TIO 1 jam setelah laser pada pasien PACG dan melihat apakah energi laser berhubungan dengan peningkatan TIO. Penulis berharap penelitian ini dapat digunakan sebagai referensi bagi dokter spesialis dalam penanganan terhadap pasien glaukoma.

**Tujuan:** Mengidentifikasi perubahan TIO segera setelah LIP dilakukan pada pasien PACG dan mengetahui asosiasi antara energi laser dengan peningkatan TIO.

**Metode:** Subjek dipilih dengan metode *consecutive sampling*. Diagnosis PACS dan CACG dilakukan oleh residen yang dikonfirmasi oleh dokter spesialis di sub-divisi Glaukoma bagian Ilmu Penyakit Mata RSUP Dr. Sardjito Yogyakarta. Pasien diberi penjelasan mengenai penelitian dan diminta menandatangani lembar persetujuan sebelum TIO awal diukur. TIO pasien diukur dengan tonometer non-kontak oleh residen di sub-divisi Glaukoma RSUP Dr. Sardjito Yogyakarta sebelum pasien menjalani prosedur LIP Nd:YAG. Semua mata terdiagnosis diberi tetes mata pilokarpin 2% 30 menit sebelum prosedur laser. TIO pos-laser diukur 1 jam setelah terapi. Data TIO awal, 1 jam setelah laser, dan energi total laser direkam dalam *spreadsheet* dan dianalisis menggunakan program SPSS.

**Hasil:** Sebanyak 46 mata dari 39 pasien yang memenuhi kriteria inklusi dan eksklusi dimasukkan dalam penelitian. 16 mata mengalami PACS (35%) dan 30 mata CACG (65%). Rerata TIO awal pasien sebesar  $15,348 \pm 3,78$  mmHg sementara rerata TIO 1 jam pos-laser sebesar  $18,361 \pm 3,56$  mmHg (95% CI, -3,68; -2,35). Ditemukan perbedaan bermakna sebesar  $3,013 \pm 2,25$  ( $p < 0,001$ ). Nilai  $p > 0,05$  pada analisis kai kuadrat antara energi laser dan peningkatan TIO dengan risiko relatif 1,47 (95% CI, [0,95-2,28]).

**Kesimpulan:** Ditemukan peningkatan TIO yang signifikan pada pasien PACS dan CACG 1 jam setelah tindakan LIP Nd:YAG. Tidak ditemukan asosiasi bermakna antara energi laser dan peningkatan TIO.

**Kata Kunci:** tekanan intraocular, Nd:YAG, laser iridotomi perifer, glaukoma sudut tertutup primer