Evaluating Postoperative Flare in Glaucoma Surgery: MINIject, Microshunt, Baerveldt Tube, Cataract & ECP and Trabeculectomy

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Introduction

Inflammation is important to consider in the post-operative period for Glaucoma interventions. Typically, it has been assessed through visible presence of flare on slit lamp assessment, however, low-level inflammation is not always clinically detectable (1).

The KOWA FM-600, a laser flare cell meter, offers accurate, non-invasive, in-vivo quantification of aqueous flare through the objective assessment of scattered light (2). The result obtain from protein density measurement is a 'flare value' represented as photon count per millisecond. The device uses a 635-nanometer diode laser, projected into the anterior chamber to scan a measurement window of 0.3 mm x 0.5 mm over 0.5 seconds. Typically, readings in a healthy individual range from 2.9-3.9 ph/ms (3). However, dilation slightly decreases flare levels (4).

Purpose

To investigate post-operative flare amongst different types of glaucoma operations. Operations studied here include:

1. Filtration surgery: Trabeculectomy with Mitomycin-C (0.4 mg/ml MMC), Baerveldt tube surgery with/without MMC, Preserflo (0.4mg/ml MMC)
2. Ab-interno: MINIject
3. Laser Surgery: Cataract & Endoscopic Cyclophotocoagulation (ECP), Peripheral Iridotomy



Figure 1: Flare Reading (3)



Figure 2: KOWA FM-600 (3)

Methods

Retrospective data collected from Guys and St Thomas' NHS Foundation Trust between July 2019 to September 2023.
KOWA FM-600 Laser Flare Meter was used to assess flare. Six readings were taken and an average flare was provided with standard deviation.
To allow for adequate data collection data, time intervals were extended (Table 1). Normative flare is set at 9ph/ms.
Mean average flare was calculated per device and graphically represented.

Time Interval	
1 week	0 days – 1week
1 month	+ 1 week
3 months	± 1 week
6 months	± 1 week
1 year	± 1 month

Table 1 (Time Interval data collection)

Conclusion

- The laser flare meter provides an accurate, reproducible, non-invasive assessment of aqueous flare which can be valuable in research and clinical decisions.
- The observed rise in flare at 1 month for Tubes is most likely associated with the removal of intraluminal stent.
- Our data suggests that sub-clinical inflammation persists in tube and least with suprachoroidal devices (MINIject).
- The contrast in inflammation between different IOP lowering devices (Preserflo, Miniject and Baerveldt Tube) is likely to be influenced by biomaterial.
- Our study highlights that subclinical inflammation can persist up to a year, if not longer and recognising this may direct appropriate long-term management of post-operative surgical cases.

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Results

Post-Operative Flare: 1 Week ,1 month, 3 months, 6 months and 1 year for each procedure (June 2019-September 2023)











