




COMMENT

Subthreshold laser therapy guidelines for retinal diseases

Jay Chhablani ^{1✉} and SOLS (Subthreshold Laser Ophthalmic Society) writing committee*

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Subthreshold laser therapy has been utilised in clinical practice for more than three decades, and numerous randomised and real-life studies has proven its efficacy and safety in various retinal diseases [1–10]. However, despite decades of usage, we still do not have a standard protocol for subthreshold laser applications and settings. The Subthreshold Ophthalmic Laser Society (SOLS) is comprised of global experts (10) in subthreshold lasers and has a goal to establish subthreshold laser guidelines and establish level 1 evidence on subthreshold laser in ophthalmology.

Here we report consensus guidelines by SOLS for the subthreshold laser settings and applications in diabetic macular oedema (DMO) and central serous chorioretinopathy (CSCR). These guidelines were based on 43 questions based on different aspects of subthreshold laser applications in these diseases. Responses were collected from each expert in a masked fashion in first round and two virtual meetings were performed to discuss these questions to reach final consensus.

For DMO, the experts support the role of subthreshold laser in both centre-involving and non-centre involving macular oedema in conjunction with or without anti-VEGF therapy. Subthreshold laser settings for DMO include 5% duty cycle, 200 ms pulse duration, and 150–200 μm spot size with no spacing between laser spots using integrated pattern system. SOLS experts support titration for subthreshold laser application with 50% of threshold power (achieved with subthreshold laser). SOLS experts suggest treating oedematous area with subthreshold laser, however, does not mandate focal treatment of microaneurysm. SOLS experts consider transfoveal treatment safe with settings described earlier, however, they emphasis the careful application and reconfirmation of subthreshold laser safe settings before application. Considering no visible or structural changes following subthreshold laser treatment, experts do not recommend any specific structural imaging studies to evaluate laser spots, however, autofluorescence or OCT could be carefully evaluated during follow up visits for any laser scars. Experts recommend follow-up evaluation at 6–8 weeks after subthreshold laser application, however, repeat subthreshold laser is suggested after 2–3 months of initial application, in case of poor response. Experts recommend adjunctive therapies such as anti-VEGF or steroid therapy for diabetic macular oedema as per the physician's discretion.

For CSCR, SOLS experts recommend subthreshold laser for both acute as well chronic types. Unlike conventional observation for 3–4 months for acute CSCR, considering the safety profile of subthreshold laser, SOLS experts recommend subthreshold laser application in 1 month if there is no self-

Table 1. Subthreshold laser consensus guideline settings for diabetic macular oedema and central serous chorioretinopathy by the Subthreshold Ophthalmic Laser Society (SOLS).

Subthreshold laser settings	Diabetic macular oedema	Central serous chorioretinopathy
Duty cycle	5%	5%
Pulse duration	200 ms	200 ms
Spot size	150–200 μm	100–200 μm
Spacing between spots	No	No
Titration	Yes	Yes
Titration power	50% of threshold power	50% of threshold power

resolution. For chronic CSCR, SOLS expert support subthreshold laser as first line as well as combination therapy with other treatment options. Recommended settings for subthreshold laser application are 5% duty cycle, 200 ms pulse duration and 100–200 μm spot size. Settings are same for both acute and chronic CSCR with no spacing between the spots using integrated pattern system. SOLS experts support these settings safe for the transfoveal laser application, with reconfirmation of subthreshold settings. SOLS experts suggest titration with 50% of threshold power (threshold estimation using subthreshold laser mode) (Table 1). Regarding area covered, for acute CSCR, focal leak and adjacent area should be treated with subthreshold laser. In case of chronic CSCR, SOLS experts suggest areas of focal as well as diffuse hyperfluorescence on fluorescein angiography. Considering no visible or structural changes following subthreshold laser, experts do not recommend any specific structural imaging studies to evaluate laser spots, however, autofluorescence or OCT could be carefully evaluated during follow up visits for any laser scars. Evaluation at 6–8 weeks is recommended and in case of poor response or persistence of the subretinal fluid, a repeat treatment with same settings is recommended, in addition to adjuvant treatment options as per physician discretion.

These consensus guidelines do not suggest management of these disease but suggest laser application guidelines using different subthreshold laser deliver systems. These guidelines would help to establish standard subthreshold laser applications in clinical practice.

¹University of Pittsburgh School of Medicine, Pittsburgh, PA, USA. *A list of authors and their affiliations appears at the end of the paper. ✉email: jay.chhablani@gmail.com

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COMPETING INTERESTS

JC has received consulting a speaker fees from Salutaris, Novartis, Allergan, and Biogen.

ADDITIONAL INFORMATION

Correspondence and requests for materials should be addressed to Jay Chhablani.

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SOLS (SUBTHRESHOLD LASER OPHTHALMIC SOCIETY) WRITING COMMITTEE

Jay Chhablani², Joshua Ong², Anand Rajendran³, Xinyuan Zhang^{4,5}, Barbara Parolini⁶, Alejandro Filloy⁷, Lihteh Wu⁸, Kenneth Fong⁹, Victor Chong¹⁰, Jose A. Roca¹¹, Xiaoling Liu¹², Jans Fromow-Guerra^{13,14} and Christine Kiire¹⁵

²University of Pittsburgh School of Medicine, Pittsburgh, PA, USA. ³Aravind Eye Hospital, Chennai, India. ⁴Beijing Tongren Hospital, Beijing Tongren Eye Center, Tongren Hospital, Capital Medical University, Beijing, China. ⁵Beijing Retinal and Choroidal Vascular Diseases Study Group, Beijing, China. ⁶Eyecare Clinic, Brescia, Italy. ⁷Joan XXIII University Hospital, Tarragona, Spain. ⁸Asociados de Macula Vitreo y Retina de Costa Rica, Primer Piso, Torre Mercedes, Paseo Colón, San José, Costa Rica. ⁹Oasis Eye Specialists, Kuala Lumpur, Malaysia. ¹⁰Institute of Ophthalmology, University College London, London, UK. ¹¹Universidad Peruana Cayetano Heredia, San Martín de Porres, Peru. ¹²School of Ophthalmology & Optometry and Eye Hospital, Wenzhou Medical University, Wenzhou, Zhejiang, China. ¹³Macula Retina Consultores, Mexico City, Mexico. ¹⁴Asociación Para Evitar la Ceguera, Hospital Luis Sanchez Bulnes, Mexico City, Mexico. ¹⁵Oxford Eye Hospital, Oxford University Hospitals NHS Foundation Trust, Oxford, UK.