SENSIMED Triggerfish® may help to assess glaucoma treatment efficacy

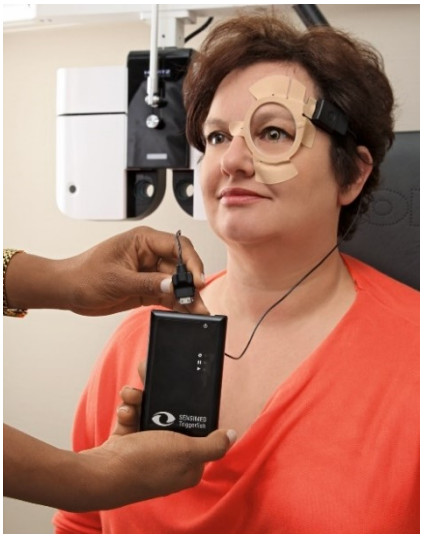
Glaucoma treatment

It is well established that IOP is a significant risk factor for glaucoma onset and progression and is characterized by substantial variability. IOP remains the sole proven modifiable factor for the disease treatment. Glaucoma medical therapy is aimed at lowering IOP using IOP-lowering drugs, laser or surgical procedures, so that the rate of progression is sufficiently slow to maintain vision-related quality of life.

In addition to the absolute IOP level, IOP fluctuations and, in particular, IOP peaks, may be related to progression.[1] These peaks tend to occur outside clinical office hours particularly during sleep. Moreover, IOP variability has been shown to be more common following medical treatment than after incisional surgical procedures[2]. However, methods to detect IOP fluctuations rely on diurnal or 24-hour IOP profiles with repeated tonometry measurements every single hour at best. These are cumbersome and expensive procedures influenced by body position that disturb patient sleep cycle.

SENSIMED Triggerfish® could be used to assess treatment efficacy of IOP-lowering intervention in clinical practice

A state-of-the-art device evaluating treatment efficacy



The SENSIMED Triggerfish® (TF) developed by Sensimed SA (Lausanne, Switzerland) is a contact lens-based device capable of recording ocular dimensional changes over the full 24-hour period in ambulatory setting, under physiological conditions.[3] With a strain gauge embedded in a soft contact lens (Sensor), TF captures spontaneous circumferential changes at the corneo-scleral junction, that occur due to ocular pressure and volume changes. TF output signals are in electronic units of millivolt equivalents (mVeq) whose mean 24-hour pattern have been correlated with the mean 24-hour tonometric curve.[4]

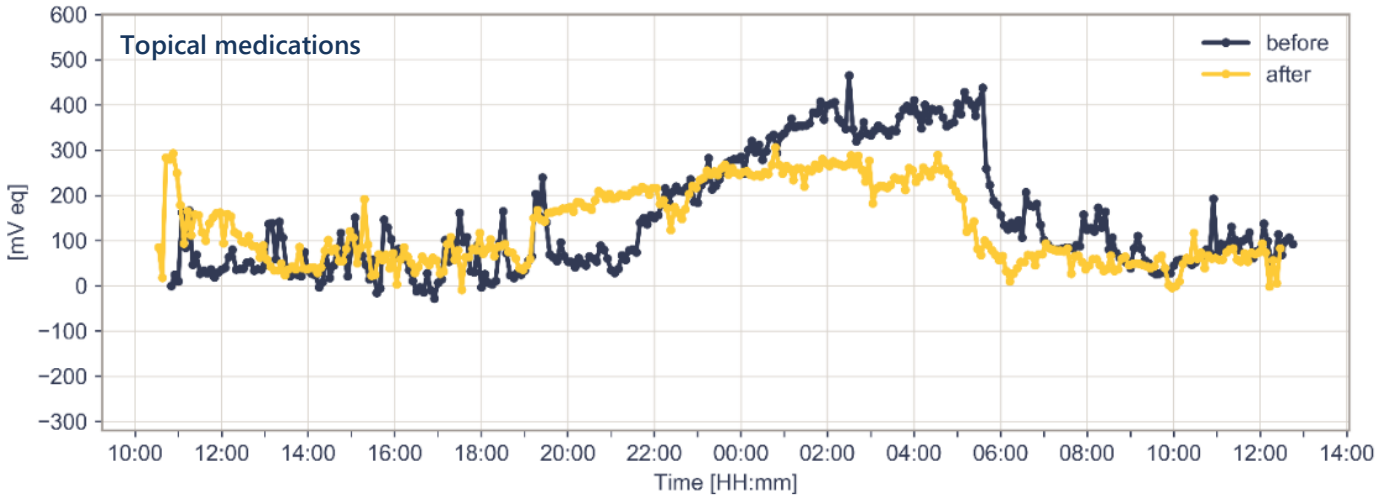
Using the TF software, two 24-hour TF profiles of an individual patient, acquired before and after treatment can be combined on a single graph and compared to identify the potential changes following the treatment.

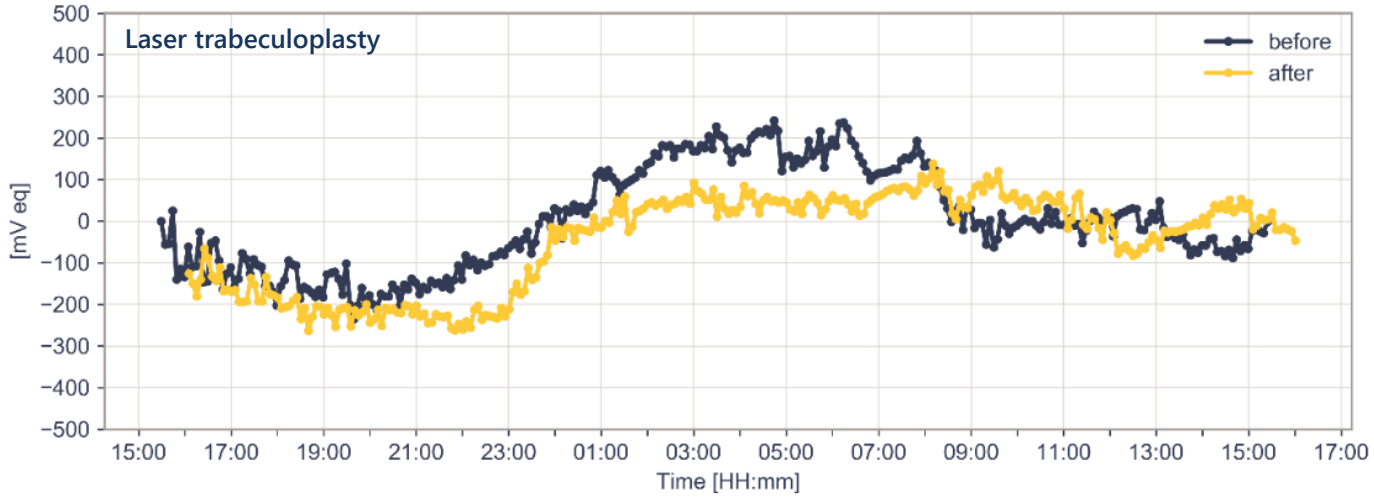
TF is a **CE** marked product also approved by **FDA** (USA) and **PMDA** (Japan).

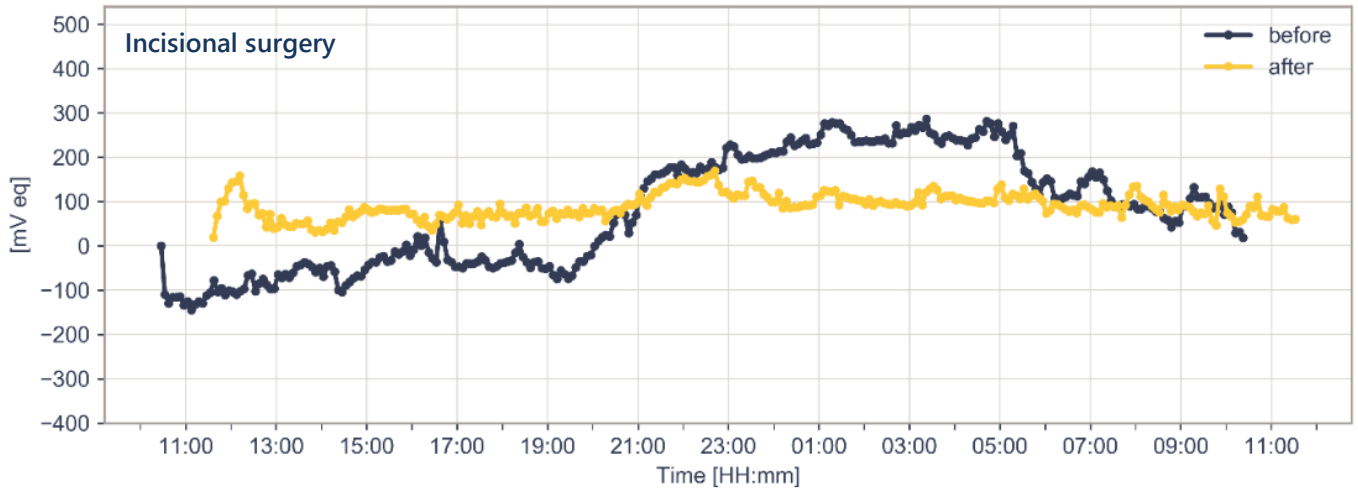
Findings

As part of a consortium study including 30 centers in 16 countries, a total of 364 profiles of 182 patients who underwent 24-hour TF recording before and 36 to 73 days after treatment with topical medications (60 patients), laser trabeculoplasty (69 patients) and incisional surgery (53 patients) were collected. Statistical analysis were then performed to compare before and after patterns.[5]

For each of the therapy, the results showed lower TF amplitudes after treatment as compared to before, more pronounced during the nocturnal period, and farther attenuated after incisional glaucoma surgery (almost flat profile) than after laser treatment, which in turn showed stronger effects on the TF profile compared to topical medications. Examples for each procedure are presented below.







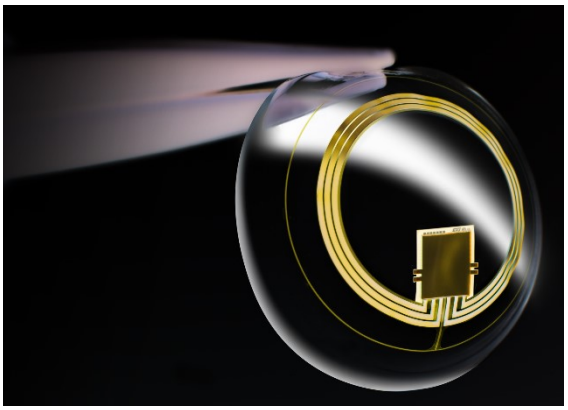
Conclusion

SENSIMED Triggerfish® is a non-implantable device capable of identifying the peak pattern related to IOP changes outside office hours. The device may detect changes in IOP-related pattern resulting from glaucoma therapy beyond daytime GAT IOP, and could be used to assess the efficacy of different glaucoma treatments, especially during the night, to help adapting the patient's treatment.

References

1. De Moraes CG, Juthani VJ, Liebmann JM, et al. Risk factors for visual field progression in treated glaucoma. Arch Ophthalmol 2011;129(5):562-8.
2. Musch DC, Gillespie BW, Niziol LM, et al. Intraocular Pressure Control and Long-term Visual Field Loss in the Collaborative Initial Glaucoma Treatment Study. Ophthalmology 2011;118(9):1766-73.
3. Mansouri K, Medeiros FA, Tafreshi A, Weinreb RN. Continuous 24-Hour Monitoring of Intraocular Pressure Patterns With a Contact Lens Sensor: Safety, Tolerability, and Reproducibility in Patients With Glaucoma. Arch Ophthalmol 2012:1-6.
4. Mansouri K, Weinreb RN, Liu JH. Efficacy of a contact lens sensor for monitoring 24-h intraocular pressure related patterns. PLoS One 2015;10(5):e0125530.
5. Cutolo CA, De Moraes CG, Liebmann JM, et al. The Effect of Therapeutic IOP-lowering Interventions on the 24-hour Ocular Dimensional Profile Recorded With a Sensing Contact Lens. J Glaucoma 2019;28(3):252-7.

About Us



Sensimed SA, a Swiss company, has developed a unique technology platform on non-invasive soft contact lens-based solution. The first application, the SENSIMED Triggerfish®, provides an automated recording of continuous ocular dimensional change over 24 hours with the aim of revolutionizing glaucoma management enhancing personalization of patient care.

The SENSIMED Triggerfish® received the CE mark in 2010 and was approved by the U.S. Food and Drug Administration (FDA) in 2016. Since 2018 the device is registered in Japan at the Pharmaceuticals and Medical Devices Agency (PMDA).

Other non-invasive on-eye sensing applications are in development to provide clinically pertinent data with the same continuous monitoring approach. The Company is furthermore focused on expanding the knowledge of how this individual data can best be used in the clinical setting to deliver customized treatment. The data, analysed and modelled on an ongoing basis, is processed in an attempt to identify pathological patterns that can be used to differentiate indication, personalize treatment and assess efficacy of treatment.

The Company is directly positioned at the convergence between devices, treatment and information. Sensimed believes that with this global knowledge-based approach it will be possible to provide valuable insights that allow ophthalmologists to better understand and treat glaucoma.

Sensimed became a subsidiary of SEED Co., Ltd after the acquisition of a majority participation end of 2019.

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