GLAUCOMA CARE DURING THE COVID-19 PANDEMIC


Research related to two key diagnostic parameters: IOP and visual fields.

BY NANDITA ANAND, MD, AND MADHU S.R. GORLA, MD

INTRAOCULAR PRESSURE TELEMETRY FOR MANAGING GLAUCOMA DURING THE COVID-19 PANDEMIC

Mansouri K, Kersten-Gomez I, Hoffmann EM, Szurman P, Choritz L, Weinreb RN[1]

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ABSTRACT SUMMARY

The cross-sectional study evaluated the feasibility and use of remote IOP monitoring with an implanted telemetry sensor (Eyemate, Implandata) during the 2020 COVID-19 lockdown. The study included 10 centers—seven in Germany, two in Switzerland, and one in the United Kingdom. Data from 37 eyes of 37 patients (16 patients with the Eyemate-IO sensor and 21 patients with the Eyemate-SC sensor) were available. The mean age of the participants was 69.3 ±9.6 years, and 48.6% were women.

A total of 8,415 remote IOP measurements from 370 measurement days were obtained. Based on the measurements, the management of five patients (14%) was altered; ocular hypotensive medications were changed for three patients, one patient was brought in for an office visit, and one patient was scheduled for surgery.

The participating study centers completed a questionnaire on the clinical impact of remote IOP monitoring with the sensor. Nine of them reported that remote IOP measurements had a clinical impact.

STUDY IN BRIEF

- A cross-sectional study demonstrated the feasibility of using patient-acquired IOP measurements with an implantable telemetry sensor in conjunction with remote IOP monitoring by physicians during the 2020 COVID-19 lockdown.

WHY IT MATTERS

Remote IOP monitoring has the potential to personalize patient care by identifying who needs to come into the office versus who has stable disease. This could improve the quality of care while decreasing costs.

DISCUSSION

Who were the study participants?

The study included participants from 10 centers where the Eyemate-IO has been implanted in patients with primary open-angle glaucoma as part of ongoing prospective multicenter clinical trials.

How is remote IOP monitoring achieved with the sensor?

The Eyemate-IO sensor is implanted in the ciliary sulcus during routine cataract surgery, and the Eyemate-SC sensor is implanted in the suprachoroidal space during nonpenetrating glaucoma surgery. The dimensions of each implant are 7.5 × 3.5 mm; each implant is 1.3 mm thick at the center and 0.9 mm thick at the edges. An external handheld reader device contains a power source and generates the electromagnetic field to power the sensor via electromagnetic coupling, which also acts as an antenna for the transmission of the signals provided by the sensor. The reader can store up to 3,000 individual IOP readings, which can be transferred to a computer via a cable connection or wirelessly into a web-based database. To obtain an IOP measurement, the reader device and the sensor implant must be brought close together after the patient presses the button on the reader to activate the electromagnetic coupling sequence.

In the study, the measured data—recorded in the external reader device—were transferred into a web-based database and sent to physicians working remotely.

What was the clinical impact of remote IOP monitoring on patient care?

As noted earlier, physicians who had access to the remote IOP measurements adjusted their clinical decision-making for five patients. Clinical management would have been adjusted for an additional five patients had the physicians had timely access to the IOP measurements. Altogether, remote IOP monitoring during the approximately 2-month lockdown period could have led to changes—mostly an adjustment of ocular hypotensive therapy—in the clinical management of almost one-third of the patients.

Other than absolute IOP readings, what is the potential advantage of continuous remote IOP monitoring?

Continuous IOP monitoring can demonstrate great variability in IOP in some patients and flag poor adherence to prescribed medical therapy in others. For example, when IOP appeared to be uncontrolled in some patients based on data gathered remotely, these individuals were contacted by phone by clinicians who inquired about problems with medications such as difficulty in procuring or instilling them.

Have there been other technological advances in the remote management of glaucoma?

Tablet-based perimetry devices such as the Melbourne Rapid Fields (Glance Optical) have been shown to be reliable in detecting moderate to advanced glaucomatous visual field loss.[2] Smartphone-based optic disc imaging has also shown potential for remote glaucoma monitoring, but pupillary dilation and an assistant may be required to capture high-quality pictures. Despite limitations to remote data, their availability can help physicians identify which patients may need an in-person evaluation.

How could the findings from this study[1] affect the clinical management of patients with glaucoma?

The data obtained remotely influenced clinical decision-making and helped to avoid unnecessary office visits during the COVID-19 pandemic. Even when the pandemic is over, remote IOP monitoring may be of value by decreasing the number of office visits and thereby the cost of health care. Further research is necessary to evaluate the long-term safety of using implantable IOP-monitoring devices.

THE IMPACT OF TAPE SEALING FACE MASKS ON VISUAL FIELD SCORES IN THE ERA OF COVID-19: A RANDOMIZED CROSS-OVER STUDY

Heidinger A, Falb T, Werkl P, et al[3]

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ABSTRACT SUMMARY

A single-center, randomized 2 × 2 cross-over study evaluated the effect on visual field scores of taping patients' face masks to prevent fogging artifacts. Twenty-six visual fields of 13 patients (mean age, 46.8 ±13.1 years) of a glaucoma outpatient clinic were included. Eight patients were glaucoma suspects, three had ocular hypertension, and two had primary open-angle glaucoma. Mean visual acuity was 0.0 ±0.1 logMAR (range, -0.1 to 0.4 logMAR), and mean IOP was 18.0 ±3.7 mm Hg (range, 14–26 mm Hg). The mean global retinal nerve fiber layer thickness measured with OCT was 101.2 ±13.4 µm (range, 69–122 µm).

Patients were randomly assigned to one of two sequences: (1) a visual field examination without tape sealing followed by one with tape sealing or (2) an examination with tape sealing followed by one without tape sealing. The results of the visual field examinations with and without tape sealing differed significantly in terms of the mean defect (mean difference [without-with tape sealing] 0.39 dB, 95% CI: 0.07–0.70 dB, P = .018) and the square root of loss variance (mean difference [without-with tape sealing] 0.49 dB, 95% CI: 0.19–0.79, P = .003).

STUDY IN BRIEF

- A single-center, randomized 2 × 2 cross-over study found that tape sealing patients' face masks during visual field testing prevented fogging artifacts and improved visual field scores.

WHY IT MATTERS

Masking remains prevalent, if not required, at many glaucoma clinics to reduce the spread of viruses such as SARS-CoV-2. Fogging artifacts are known to occur during visual field testing when patients wear face masks. Tape sealing is a simple, cost-effective method of optimizing visual field scores..

DISCUSSION

How did tape sealing the face mask during visual field testing affect the examination's reliability?

It prevented fogging artifacts and improved visual field scores.

What type of artifacts were visible on visual fields affected by fogging?

The artifacts secondary to fogging were diffuse and did not resemble glaucomatous visual field defects. The investigators could not detect

a clear common feature of the face mask–related artifacts. They were generally located more at the periphery than in the center of the visual field.

How did the stage of glaucoma affect the results of the study?

The investigators sought to determine whether tape sealing affected visual field scores in general, so participants had only mild or no glaucomatous damage. Further research is required to evaluate the effect of tape sealing among patients with more advanced glaucoma for whom the results of visual field testing are more variable.

What are the limitations of the study?

First, the study primarily included patients with suspected glaucoma and ocular hypertension. Second, there was no washout phase because the second visual field examination occurred immediately after the first one. Third, only one perimetry program was used—the Octopus 900 G2 (Haag-Streit).

What are the study's implications for clinical practice?

Refractive lenses are used during visual field testing. Several prior studies have highlighted the problem of fogging artifacts when individuals wear face masks during visual field testing.[4,5] Based on the study by Heidinger et al,[3] clinicians may wish to consider routinely sealing patients' face masks with tape during visual field testing to improve the reliability of the results. ■

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