



Clinical Use of Transpalpebral Diaton Tonometer in General Medical Practice

Dear Colleagues,

I am an Ophthalmologist. I have been working with Moscow Medical Academy, Department of Family Medicine to determine new ways and new technologies that will allow Family doctors to help solve a problem of Blindness due to Glaucoma, the second most common cause of blindness Worldwide.

It is estimated that 4.5 million people globally are blind due to glaucoma. This number will rise and more than double to 11.2 million by 2020. It is important to note that due to the silent progression of this disease up to 50% of effected people in the developed countries are not even aware of having glaucoma, especially in the early stages. This number is as large as 90% in underdeveloped parts of the world.

How can Family Doctors Help with this ongoing and life changing problem?

Today in the family and general practice - we have quick and easy methods to measure blood pressure and glucose blood level, these important tests allow us to decrease the risk of heavy complications of hypertensive disease and diabetes -- As a result save patients lives!

This raises a number of Questions -Why should a family doctor be involved with pre-screening for glaucoma??

We know that for ophthalmologists, measuring Intraocular Pressure (IOP) is one of the main obligations and every day practice to diagnose eye diseases when seeing patients 40 years and older.

Besides the normal IOP range, there are the following pathological states of the IOP: hypotension and hypertension. Hypotension is a symptom of various difficult eye diseases, such as retinal detachment, penetrating wound of the eye, mesenchymal and mesodermal dystrophy, among others. Elevated IOP can indicate glaucoma, as well as a potential symptom of inflammatory diseases of the eye, intraocular and/or orbital tumor process, or exophthalmos of various different causes.

IOP abnormality can be a symptom of different diseases. Therefore, regardless of the reason why the patient decided to consult the family doctor, it is necessary to evaluate IOP in order to perform primary diagnostics of his condition and decide an issue of necessity and urgency of a consultation by an ophthalmologist.

One of the reasons of late detection of glaucoma at its early stage is the absence of clear symptoms that attract patients' attention - in most cases there is no pain. Once incurred, visual damage is mostly irreversible, and this has led to glaucoma being described as the "silent blinding disease" or the "sneak thief of sight". It is considered that the rise of intraocular pressure (IOP) is one of the main risk factors of glaucoma development. By following up with patients, having information about possible genetic predispositions and paying close attention to patients in high-risk groups, family doctors have the opportunity to detect glaucoma at its early stage with the ability to measure intraocular pressure with an easy and available way – non-invasive, transpalpebral, over the eyelid tonometry.

The purpose of our research was to determine the necessity of IOP measuring by a general practitioner (family doctor) for intraocular pressure estimation.

Transpalpebral tonometer diaton (GRPZ, Russia) was used for IOP measuring. The device is user-friendly, does not contact directly with the eyeball during the measurement and the test is done through the upper eyelid.



Since the measurement is done over the upper eyelid there is no contact with the eyeball, there is no risk of infection during the test, making this procedure safe. Transpalpebral tonometry doesn't require the use of anesthesia drops and staining agents and it is comfortable for the patient and saves time for

medical staff. IOP measurement with diaton can be taken with the patient being in sitting position or laying down. Since the measurement is done through the upper eyelid and over the sclera, not the cornea, corneal parameters such as corneal thickness, crookedness or past corneal surgeries do not affect the IOP reading - even contact lenses do not need to be removed for accurate reading.

Intraocular pressure measurements were carried out either by general practitioners (family doctors), nurses or other assisting medical technicians.

440 patients were examined, ages 10 – 92.

404 patients had normal values of intraocular pressure.

24 patients, age 66 – 92, with diagnosed glaucoma, who use constant medication, but didn't have regular IOP monitoring, had high intraocular pressure which indicates an advance of the illness.

3 patients had high intraocular pressure which was detected for the first time, and resulted in diagnosed glaucoma after consultation with ophthalmologist.

8 patients had low intraocular pressure and they were referred to an ophthalmologist.

5 patients had upper, boarder line normal IOP. After further consultation by the ophthalmologist the IOP was normal.

Thus, the comparison trial results that were carried out, allowed to make the following conclusions:

1. Tonometer diaton device is the non-invasive, safe method which is comfortable for the patient and handy for the doctor for IOP estimation.
2. You can carry out repetitive daily monitoring of intraocular pressure with diaton without losing quality of the consecutive measurements. The importance of this monitoring is unquestionable for progress monitoring and detecting pathology advancement, and for selecting the optimal choice of treatment tactics during regular medical check-ups. When you are recording the log journal of IOP readings, you help an ophthalmologist to see the clinical presentation, take into account individual features of the patient and choose the unique glaucoma treatment regimen.
3. diaton allows, without damage to the patient, to determine intraocular pressure and to control medications which can lead to possible ocular hypertension, as their secondary effect.
4. Maintenance of the device in the family doctor's office presents no difficulties.
5. diaton can be used either by a family doctor or by any trained medical staff within the general practice department.

Considering the necessity and availability for general doctors to obtain IOP, without the need for specialized ophthalmologic office setup, we came to the conclusion that the evaluation of intraocular pressure is an integral and especially significant part of the general medical examination. Only joint



efforts of the family doctor and ophthalmologist can make a prognosis for ophthalmologic diseases and save vision for many years.

To emphasize the importance of this quick intraocular pressure test by family doctors and its potential benefits on a larger scale, being here in beautiful Mexico with population of 111 million - in correlation with an outcome of our study we would be able to diagnose and potentially save vision of about 1 million people.

Please note that other country statistics may be lower or higher due to demographics and population base.

And a last statistic I have to share with you: There are only 150,000 ophthalmologists for a world of 7 billion people - that comes to 46,000 people per ophthalmologist - the people and the eye doctors surely need your help.

Thank you for your attention and your future action!