

## How to Fight Migraines?

The coincidence that many years ago led a befriended patient of mine to my ophthalmologist's office caused that during performing gonioscopy for a long time I accidentally induced a migraine in that woman (aged 31) and I found things that had not been described before either in ophthalmology or neurology books. Knowing that clinical symptoms of a migraine attack are almost the same as those of closed angle glaucoma, from the beginning of my observations while examining patients I paid a lot of attention to gonioscopy and the possibility of increasing pupillary block with secondary angle closure, if any. My development of new techniques during gonioscopy and methods of "illuminative" tonography as well as monitoring effects of the removal of the pupillary block in "migraine" patients have all most likely allowed me to discover the cause of migraines, which, to me, is the increased relative pupillary block with a secondary increase in intraocular pressure in the posterior chamber of the eye and vitreous humour with the subsequent increased arterial and venous pressure in the skull.

The acronym defining migraine as described by me is:

**MIGRAINE** - **M**ultiple Indisposition **G**enerated **R**apidly **A**gainst IOP (intraocular pressure) increase to **N**eurological **E**mergency

Obviously, I am not able to help all those affected by myself, whereas many of you are still waiting for help or the possibility of providing it to patients. For this reason, I would like to outline practical guidelines for Migraine Doctors and Patients by sharing, as far as possible, the whole knowledge of migraine treatment I have gained so far.

Based on the observations of "migraine" patients examined by me at my ophthalmologist's office and on working on the mechanism of migraine, I have managed to create a list of guidelines which is able to reduce the intensity of migraine seizures, and in some cases even eliminate their occurrence without the need for further treatment.

I hope that, just as in most of my patients, also in your case it will let you win the fight with the disease and pain that is only a symptom of a serious systemic disorder, which migraine is regarded to be according to the definition put forward by me. The disease that is likely to lead to a number of serious ophthalmic (e.g. glaucoma) and neurological (e.g. "idiopathic" intracranial hypertension, stroke, etc.) disorders.

Please adopt an indulgent approach to treatment, bearing in mind that it will not always be possible to remove an increased pupillary block using only drops and eyeball massages, which is determined by a "difficult" eye structure in quite a few "migraine" patients that compels treatment using the only effective way recommended for ophthalmic reasons, which is YAG-iridotomy. Due to specific disorders in reciprocal iris-lens-cornea relationship, which can be ascertained during gonioscopy, many of you may not even be able to apply cycloplegic or myotic drops that often reduce pupillary block and fight migraines when used with an eyeball massage.

Being glad that migraine ceased after pupillary block with closed angle had been found and thus iris laser surgery had been performed, please be aware that the disease may often return after some time due to secondary obstruction of the iridotomy hole. Then, the hole will have to be unblocked again or a new one performed.

Not everything depends on us, doctors. Not every patient responds well to the therapy, whereas each patient's eyes respond differently to drugs and treatments which we use

trying to cure both glaucoma and migraine, eliminating their causes but not effects, as this has been so far in migraine treatment.

## **MIGRAINE THERAPY:**

Migraine treatment following the model proposed by me is based on the possible limitation of its risk factors:

- avoiding increased pupillary block (appropriate optical correction of vision defects, limiting increased accommodation, preventing pupil constriction while pupillary dilator being tense, keeping proper head position in respect to anti-gravity inhibition of triggering the mechanism of migraine in the eye, elimination diet, fighting stress)
- inhibiting aqueous humour secretion (elimination diet, fighting stress, anti-glaucoma medications)
- maintaining normal blood pressure at as high level as possible (diet)
- facilitating the flow of aqueous humour in the eye from the posterior to anterior chamber and to the venous system: cycloplegics with mydriasis (paralysis of accommodation with pupil dilation) or myosis (pupil constriction), eyeball massage, laser iridotomy

## **I. Migraine Prevention**

### **1. avoiding increased relative pupillary block during accommodative tension by:**

- avoiding as far as possible working in near-vision conditions (computer, precision works, etc.)
- avoiding tilting your head over your smartphone, tablet, laptop, book on your lap; do not read keeping your book on your belly, under your nose; take frequent breaks and accommodate your eye to near vision as much as possible; a book should be held "in front of your eyes", and not "under your eyes", you have to look into the distance every now and then, close your eyes for a moment and blink, but not squint your eyes, etc.
- reading and working within the near vision and in proper lighting conditions, which abolishes pupillary dilator tension while the pupil being constricted, which is determined by accommodation reflex
- in people with hypermetropia (with or without presbyopia) - using the right near-vision glasses
- in people with myopia (with or without presbyopia) - removing glasses for reading, using adequately weaker (minus) near-vision glasses (for higher degree myopia), using contact lenses with full myopia correction power when working in near-vision conditions, but only provided that additionally "plus" glasses are on, which impair the minus power of correction by contact lenses

### **EXAMPLES FOR SHORTSIGHTED PATIENTS:**

- vision defect of  $\leq - 2.0$  D; do not use distance-vision glasses while reading, which reduces the total time of accommodation and increased pupillary block during the day
- visual defect of  $> - 2.0$  D; glasses for reading weaker by 2.0 D, and computer glasses by 1.5 D (keep a book away from your eyes, as this is possible; it should be moved the furthest until your vision becomes blurred and then it should be moved a little closer in order to be able to read)

- visual defect of  $> -1.0$  D; wear progressive glasses with add power for near vision (+1.0D to +2.5 Dsph depending on the defect and age), which allows you not to remove glasses for reading, computer, etc.
- visual defect of  $> -0.5$  D and wearing contact lenses to fully correct the defect for distant vision; wear plus glasses for near vision that weaken minus correction in the myopia of the "eye/contact lens" system and limit accommodation
  - e.g. a contact lens with power for distant vision of  $-2.0$  D SE, whereas for reading in contact lenses additionally wear near vision glasses of +2.0 Dsph in a person under 45. / accordingly stronger for correcting presbyopia in elderly people
  - e.g. a contact lens with power for distant vision of  $-4.0$  D SE in people under 45, whereas for reading in contact lenses additionally wear near vision glasses of +2.0 Dsph, and for working with the computer and documents on your desk +1.5 Dsph / accordingly stronger for correcting presbyopia in elderly people

*NOTE! Progressive glasses are not a comfortable form of correction to be used for a long time for reading or a computer, but they let you reduce the risk of migraine and of the increase in short-sightedness without removing glasses for a short work in near vision; for working longer and looking near, you had better use separate glasses only for near vision*

*NOTE! I measure the value of myopia using refractometry always after a thorough paralysis of accommodation; even in patients over 40 years of age, as from the experience of many eye doctors and my own I know that people who regularly work in near-vision conditions (a seamstress, an IT specialist, an accountant, a computer graphic artist, an electronics engineer, a dentist, a watchmaker and every man who spends a lot of time in front of a computer, laptop, smartphone, tablet, doing embroidery work, precision DIY, etc.), even though they are over 40 years old, they can develop an accommodation spasm and refractive error of measurement done without cycloplegics; wearing too strong glasses in myopia or minus ones without a vision defect is relatively common among patients working in near-vision conditions and it is often the only source of eye and head aches*

## **2. avoiding increased relative pupillary block through limiting pupil constriction**

- avoiding sudden changes in eye lighting (do not go to disco with stroboscopic lamps, and even during a moderately sunny day, use sunglasses and a peaked cap; while travelling by car or train in the day, it is recommended that you do not look directly at the sun flashing between the trees or wagons of another train, etc.)
- not driving your car at dusk (being dazzled with reflectors, street lamps), and while being a passenger, not looking towards oncoming cars
- allowing your eyes for smooth adaptation to changes of light from dark to light one (e.g. after a cinema showing leaving the auditorium for a long time, and then exiting the cinema slowly even during a moderately sunny day; not going out of the cellar rapidly, not switching on bright light when waking up at night, not opening window shutters rapidly, not lifting roller blinds in the windows too quickly, etc.)

## **3. avoiding increased relative pupillary block through appropriate head position**

- lying and sleeping on the side or on the back; however, there are a few people for whom the position "on the back" is obviously harmful; look in the distance (not with your face down!)

- avoiding reading and looking at close objects with a tilting head or lying down; do not accommodate your eye and tilt your head at the same time, as the lens freed from the suspensory ligaments of the Zinn's ciliary zonule gravitationally moves axially down and blocks the pupil from the back (in this position from the top), which increases the "posterior" intraocular pressure (behind the iris). Through the pressure on intraocular blood vessels increased in this way, this causes or intensifies migraine; therefore, among other things, during a migraine patients feel "as if their head was going to explode" and their face their shoes looking up, and not down...
- avoiding working in a tilted position and neck-bending forward; as when coughing, pushing by abdominal press and uplifting, this causes the occurrence of Valsalva's manoeuvre and blocking venous blood flow from the head, which increases intracranial venous pressure and induces or intensifies the mechanism of migraine

*NOTE! In short-sighted and/or slim people, probably due to less orbit fat, in the face-up position the eyeball (larger and heavier in short-sightedness) gravitationally presses the orbit structures located behind it, including the ophthalmic artery and veins, which often induces and/or intensifies migraine*

*NOTE! when the eye is positioned cornea-down due to gravity acting on the lens, hydrostatic pressure of the vitreous humour, pressing the lens from the top and overpressure growing behind the lens after blocking the pupil when aqueous humour is still produced, the lens is like a "plug in a filled bath", where we are still adding water; everyone knows how difficult it is to remove the plug from the bath when hydrostatic pressure pushes it into the water discharge opening, like the lens from the back into the pupil... If the tightly closed bath was turned upside down, the plug would fall out itself...*

#### **4. avoiding increased relative pupillary block and inhibiting aqueous humour secretion / diet:**

**Caffeine (theine), theobromine, theophylline, tyramine, mescaline** are the compounds found in many foodstuffs which through numerous links induce and/or intensify migraine (article titled "Biochemistry of Migraine" in preparation)

For example, caffeine (theine) through a competitive inhibition of cAMP phosphodiesterase prolongs and strengthens the activity of adrenaline that stimulates ciliary body receptors to secrete aqueous humour into the posterior chamber of the eye and tenses the pupillary dilator, which results in an increase in the "posterior" intraocular pressure, i.e. in the posterior chamber of the eye and vitreous humour, triggering the mechanism of migraine in the eye. Caffeine is metabolised in the human body to theobromine and theophylline, among other things, which probably also intensify the migraine mechanism as proposed by me.

It is necessary to eliminate from the diet those types of food containing the listed chemicals, which migrainers should already recognise as causing migraine... Nota bene, for a long time in cardiology the "cheese effect" has been known. It was described after first-generation MAO inhibitors had been included in the treatment; the mechanism is based on the prolonged activity of tyramine contained e.g. in large quantities in cheese and mouldy cheese, which, because of its blocked decomposition, leads to severe headaches and life-threatening hypertensive crises; the analogy with clinical symptoms of a migraine seizure is obvious!

- do not drink: **coffee, tea** (any type - black, green or white!), soft "coke" type drinks, energy drinks, **cocoa**

- do not eat: **chocolate**, hard (**yellow**) cheese and mouldy cheese, red meat, herring, peas, beans, soya beans, nuts (especially peanuts)

## 5. inhibiting aqueous humour secretion / fighting stress

Avoiding stress is becoming the most difficult issue in our times. While tensioning the vegetative system (adrenergic stimulation), using endogenous hormones (adrenaline, noradrenaline) it additionally intensifies the phenomena which constitute the basis for the migraine mechanism as described by me.

Are there many readers of this article who remember how grass on the glade smells?

Are there many readers of this article who remember how a mountain stream murmurs?

How footsteps crunch on gravel on a forest path?

How water falling from kayak paddles splashes?

How resin smells and how birch leaves rustle on a wild beach by a lake?

I could ask you and myself even hundreds of such questions, but I guess everyone already knows what I mean... It will not help here even if you hold a membership card of a fitness club, where loud music, a TV screen flashing by your stepper or being near aggressive people do not foster relaxation... It will not help either if you sit in front of your TV and watch weather forecast for the seventh time after another set of news stories which will inform you about another scandal, disaster and murder... Turn off your TVs, mobile phones and go climbing, go for a walk in the woods, go canoeing, go back-country trekking in the fields, and not on the pavement in the centre of Wrocław or Warsaw... Go for a run far away by a river, and not along the highway... Hush up in the bosom of nature... Without headphones in or on your ears...

Migrainers are generally intelligent, very sensitive people who stifle their emotions, which I can see during the visits in my office. What do I need to do to defeat stress?

- it is worth avoiding stressful situations as often as possible (if your job is great, but the boss is a bad man... then the job is not attractive and you even have to flee; it's a waste of health, and besides, after a few weeks or months of sick leave during a year due to stress-driven migraines, you can expect dismissal any way in an atmosphere which will not add to your health...)
- it is worth seeking help at a Psychiatrist and/or Psychologist (not for "medicines", but for learning how to handle stress, for a possible change in attitude to the world even if through different techniques of learning assertiveness, self-acceptance, etc.)
- it is worth doing your best to organize your life if you find something that makes it really harder, such as family, financial or work problems, problems with your neighbours, etc.
- it is worth taking care of your sexual sphere, making it possible to discharge emotional tension (before migraine occurs)

## 6. increasing pressure in the choroid

- drinking large quantities of water in a situation when fluctuations in atmospheric pressure lead to drops in blood pressure
- drinking large quantities of water in a situation when high temperatures lead to dehydration
- drinking water before going to sleep in order to limit night drops in blood pressure

In the next two sections I am going to discuss the proposed conservative and procedural treatment of migraine which, being often treated effectively with purely ophthalmic indications, tends to confirm in a huge part the pathophysiological mechanism of the disorder proposed by me.

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