

Physical training and ocular yogic exercise in home: good alternative options to control the high-tension form of primary open angle glaucoma during the repeated COVID-19 waves

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A defected visual field of optic nerve degeneration is referred to as glaucoma. Glaucoma is caused by diabetes mellitus, aging, black ethnicity, and family history, but the most important modifiable risk factor is elevated intraocular pressure (IOP). The most common type of glaucoma-inducing irreversible blindness, high-tension primary open angle glaucoma (HTPOAG), is described by an IOP > 21 mmHg and an open angle of the anterior chamber of the eye [1].

Lowering IOP is the most evidence-based technique for slowing the progression of HTPOAG. Aside from the unfavourable outcomes in many glaucoma patients, the use of IOP-lowering medications has been linked to several negative side effects [2]. Dynamic exercise [3], acupuncture, yoga, meditation, and yogic ocular exercises [4] are examples of non-pharmacological complementary therapies.

The implementation of routine medical follow-up of IOP measurements, IOP-lessening pharmacotherapies, and HTPOAG progression during outpatient- or hospital-centred face-to-face interviews during the coronavirus disease 2019 (COVID-19) can trigger a large risk of viral infection [5].

Patients with chronic diseases are less enthusiastic about the face-to-face long-term treatment facilities offered in physiotherapy centres, gyms, and alternative medicine centres as a result of repeated government and health warnings not to leave homes unless absolutely necessary to reduce the risk of COVID-19 cross-contamination.

During the COVID-19 disaster, imposed or self-selected social distance has a number of negative mental and psychological stressors. Isolation-induced tension raises IOP,

causing glaucoma to worsen [6]. During the first, second, and third waves of the COVID-19 disaster, there were repeated demands for health professionals, including physiotherapists, to engage in home-based exercise services for patients with chronic diseases to reduce tension, mental restlessness, and psychological distress caused by social isolation [7–9].

Simple recommendations to perform low- or moderate-intensity home-based dynamic exercise (limb stretching, treadmill walking, ergometer riding, and jogging) must be introduced to HTPOAG patients to control their IOP under the remote online-supervision of physiotherapists.

Aerobic exercise has been shown to lower catecholamine levels, especially norepinephrine concentrations. Regular activity increases the parasympathetic-sympathetic input ratio at rest, enhancing the relative release of acetylcholine-norepinephrine. The IOP can be reduced by these autonomic changes after routine exercise [10].

Complementary treatments are often used to treat chronic diseases [11]. Yoga is a commonly used old Indian method that is used as a supportive therapeutic technique in the treatment of long-term chronic pathologic conditions like primary open angle glaucoma with the aim of lowering IOP, enhancing body-mind spiritual reunion, reducing mental tension, reducing ocular exhaustion and restlessness, and reducing eye strain [12].

During the COVID-19 pandemic, yoga teachers and physiotherapists are being asked to include the components of a home-based yogic ocular exercise to glaucoma

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patients. A regular yogic ocular exercise session (5 rounds of 2-minute maximal vertical, to-side, and circular eyeball movements plus a 1-minute in-between-round palming exercise) will increase the maximum constant stretching of bulbomotor or extraocular muscles.

The ocular venous return and metabolic ocular muscular demand increase as these muscles are stretched and contracted repeatedly. Palming exercise (covering the eyes with cupped hands after rubbing them together) often improves the warming and relaxing feeling in the eyes. As a result, by providing more blood, warming, relaxation, and oxygenation to the eyes, the elevated IOP in HTPOAG can be decreased.

Due to the inhibited over-activation of the sympathetic nervous system, guiding the patient to begin and end the home-based session of yoga ocular exercise with breathing exercise (slow deep inspiration followed by slow relaxed expiration) will bring the patient to the maximum level of relaxed body response. In addition, in HTPOAG patients, this relaxed response may help to lower their elevated IOP.

Yoga teachers can also advise patients on how to perform *trataka*, a yogic exercise that lowers IOP. The continuous and prolonged visual gazing at a specific point of an object, such as a candle flame, is known as this exercise. *Trataka* can lower elevated levels of IOP in glaucoma patients [2], in addition to improved mental stress, insomnia, and quality of life.

Trataka causes the ciliary muscles of the eye to contract, causing the open angle of the anterior chamber of the eye to extend. The trabecular mesh tissue of the eye is unlocked by this stretch, allowing the aqueous humour to flow freely. Long-term drainage and/or outflow of aqueous humour in response to *trataka* may help to lower HTPOAG's elevated IOP [13].

The previous recommendations must be stated on various media (Facebook, television, Instagram, and website of national health ministry) with the constant clarification of the value of a healthy mental and psychological existence in addition to preventing dangerously elevated IOP levels.

Additionally, continuous monitoring from physiotherapists and yoga teachers to the home-based implementation of these instructions is simple to do by pre-arranged group appointments on Zoom video-conference sessions to improve glaucoma patients' adherence to the exercise.

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