

Effect of Points Zanzhu (V2), Taichong (H3) and Taixi (R3) in the Decrease of Intraocular Pressure in Glaucoma Patients. Exploratory Study

Rodríguez-van Lier ME^{1,2*}, Pérez-Guevara CA¹ and García-Piceno Y^{1,3}

¹Universidad Estatal del Valle de Ecatepec, Sección de Acupuntura, México

²Escuela Superior de Medicina, IPN, Mexico

³Centro Interdisciplinario de Ciencias de la Salud, IPN, Mexico

***Corresponding author:** M Esperanza Rodríguez-van Lier, Universidad Estatal del Valle de Ecatepec, Av, Central esq, Leona Vicario s/n, Valle Anáhuac, 2^a secc. C.P. 55210, Ecatepec de Morelos, Estado de México, México, Email: rodriguezvanlier@yahoo.com.mx

Published Date: December 29, 2015

ABSTRACT

Glaucoma is one of the leading causes of blindness in population which is manifested by an increase of intraocular pressure above normal values that ranges between 12 and 20 mmHg, also producing, after a few years, an alteration to papillary level showing a decrease of the neuroretinal ring and typical defects of the visual field, as a result of the death of the retinal nerve fibres. The purpose of this paper was to evaluate the blood pressure lowering effect of Zanzhu (V2), Taichong (H3) and Taixi (R3) points stimulated with needle in patients with glaucoma. A randomized, prospective, longitudinal, comparative, experimental study was made in 43 patients with glaucoma diagnosis with numbers larger than 20 mmHg of intraocular pressure. Acupuncture treatment was of 8 session and measurements of tonometry and gonioscopy were performed. Results were evaluated with paired t-test and program SPSS V.15, being the value of intraocular pressure of ($p < 0.05$). Acupuncture can reduce intraocular pressure in patients with glaucoma.

Keywords: Acupuncture; Glaucoma; Psiconeuroinmunoendocrinology.

INTRODUCTION

Open angle glaucoma is the set of processes in which elevated intraocular pressure produces lesions mainly affecting the optic nerve, which causes visual field loss; this may be total if process is not stopped [1]. Glaucoma is classified according to the anatomical characteristics it presents, in open angle (where the angle of the anterior chamber of the eye is open) and closed angle (where anterior chamber angle is closed). If the eye does not have any pre-existing disease, glaucoma is considered primary. Secondary forms of glaucoma are caused by various ocular or systemic illnesses such as pigment dispersion syndrome and ocular trauma [2].

In the world there are approximately 314 million people with visual disabilities, 45 million of them are blind. Globally, approximately 87% of visually impaired people are elderly and live in developing countries. Approximately 85% of global cases of visual impairment are avoidable [3].

OMS ranks glaucoma as the second leading cause of blindness. Currently 4.5 million people have glaucoma and there is a projection of 11 million by the year 2020 [3]. Other causes of blindness are cataracts, age-related degeneration of macula, corneal opacities, and diabetic retinopathy, trachoma and childhood eye conditions, such as xerophthalmia [4].

Recently, acupuncture has been applied widely for the treatment of various conditions, such as neck pain, shoulder pain, lower backache, headache, eye diseases including glaucoma [5] and hypertension; it has also been effective in different conditions on several randomized trials [6-12].

Acupuncture is a branch of traditional Chinese medicine that has been used for over 5000 years. Its philosophy, in the presence of disease, poses an imbalance between two opposing and inseparable forces (Yin-Yang). The variability between these two forces is associated with an obstruction in the flow of Chi (vital energy) which leads to the appearance of the disease.

The exact action mechanism and physiological effects of acupuncture are not very well known. In the West hemisphere investigations have only focused on explaining how acupuncture works from a Western medicine point of view

There is a hypothesis, at present that proposes that the mechanisms of action are focused on the Psiconeuroinmunoendocrinology (PNIE). There are 4 systems that communicate among themselves on a permanent basis, processing information, matter and energy, and thanks to these an interaction between human beings and the environment exists. These systems are the mind, central and peripheral nervous system, the endocrine system and the immune system and as a whole form the system of the PNIE, which explains the multi-directional interactions between the mind-brain-body and environment at a molecular, cellular and organic level that can directly impact on the health and quality of life of the individual and the systems involved [13].

The body is as a “psychophysical bio system which is autonomously capable of capturing (feeling), decoding (perceiving), storing (learning), elaborate (conceptualizing, reasoning,

understanding), symbolize (think, talk), evaluate (get excited, desire) and issue (acting), information from and to its environment through behavior”, the human body is no longer viewed as a compliant structure, but as a multi-directional correlation, a true and unique mind-body essence. Monistic conception of the mind body connection which is now being taken up more strongly as corporeality [13].

The objective of the present study was to evaluate the blood pressure lowering effect of Zanzhu (V2), Taichong (H3) and Taixi (R3) points stimulated with needle in glaucoma patients.

MATERIAL AND METHOD

Subjects

Once the Research and Ethics Committee approved the project, patients diagnosed with glaucoma were invited to participate in this study. Voluntary patients who signed the letter of consent, of differing genders and between 30 to 70 years of age, with hereditary familial history of diabetes mellitus, hypertension and/or glaucoma, Intraocular Pressure (IOP) greater than 20 mmHg and pharmacological treatment of at least 3 months were also accepted. Patients with presence of cataract or any other treatment (surgical, laser, herbal, homeopathic or naturopathic) were excluded from the study. Uncooperative patients and those who required emergency treatment for reasons unrelated to the investigation were eliminated.

Procedure

A prospective, longitudinal, comparative, experimental randomized study was conducted. People were selected by simple random sampling and were divided into two groups: control group (A) and problem group (B). Members of both groups were asked to read and sign informed consent and thus were accepted in this project. The letter of consent gave detailed information about the procedure to be used as well as the benefits, rights and risks to the participants.

Control

Group A underwent medical history and tonometry by indentation with a Schiötz Riester monitor as well as a gonioscopy of Goldman and kept record. After that they medication (timolol, dorzolamide, KrytanteK and latanoprost, alone or in combination) in the affected eye was administered. They were allowed to rest for 10 minutes and scheduled to attend every 8 days to follow the same procedure to make a total of 8 sessions.

Acupuncture

Group B underwent medical history and tonometry by indentation with a Schiötz Riester monitor as well as a gonioscopy of Goldman. Subsequently proceeded to puncture the chosen points, according to the philosophy of traditional Chinese medicine, with a disposable, sterile, stainless steel needle, 25 X 25 mm; HBW Supply Inc., China. Puncture of points, previously disinfected with antiseptic alcohol cotton wads and following Zanzhu, Taixi and Taichong points,

were placed in the following way: Zanzhu and Taixi were placed on the side where we found elevated IOP and the Taichong point on the opposite side to the condition. The depth of needle insertion was: for Zanzhu of 5 mm, Taixi and Taichong of 15 mm, while the patient was in prone position. Manipulation of needles was in a clockwise direction, one minute toning technique, and the needles were left for 15 minutes without any manipulation. The needles were removed and the patients scheduled to report in 8 days to perform the same procedure in each appointment, up to 8 sessions.

The applied therapy, for both the control group and the problem group, was performed in the first hours of the day (8:30-11:30 hrs.). No other type of intervention was used. A licensed acupuncturist applied the acupunctural treatment to the problem group and three licensed optometrists applied drug treatment to the control group.

Measurements

IOP measurements were carried out before applying any of the two treatments and were registered between 8: 30 and 11: 30 hrs. These measurements were made by the same professionals in order to avoid variations.

Measurement of tonometry was performed using an applanation tonometer with the patient in a sitting position; a drop of anesthesia (tetracaine) was placed in each eye with patient closing eyes for 1 minute to prevent epiphora and photophobia. Tonometer was calibrated prior to taking PIO. Patient had to look down with both eyes open while the technician carefully separated the eyelids (upper and lower) and placed the tonometer centered on the cornea of the patient with a slight pressure on the eyeball. Reading was observed in the scale of the tonometer; this maneuver was performed three times and results were averaged.

To make the observation of chamber angle, gonioscopy technique was used. This technique is used to make a correct diagnosis, it is essential to be able to view anterior chamber angle. This is a diagnostic method that helps us to assess the depth of the sinus camerular with help of slit-lamp and special lenses (gonioscopic). Viscogel (hypromellose 2%) was applied to the center of the concave part of the lens, patient being in a sitting position in front of the slit lamp, topical anesthesia was applied in the eye (s) being examined. Using the free hand, the patient's eyelids were opened whilst holding the gonioscope with the other hand. The patient was asked to look upward and the lower edge of the lens is inserted into the bottom of the lower lid. Pressure was applied against the cornea carefully and quickly, in such a way that insertion was not displaced. Mirror's position was placed at 12 H to display the bottom corner and then rotate in clockwise direction. Location of structures was observed: Schwalbe line, trabecular mesh, scleral spur, ciliar body band, iris ciliar forld and circular iris fold.

Statistical analysis with the Software SPSS V.15.0 to a 95% confidence interval is performed with a statistical significance of ($p < 0.05$). Parameters between before and after control group and problem group were analyzed with paired t test.

RESULTS

The development of the study was obtained from a total of 43 people which had been given a treatment of 8 sessions, one per week. The characteristics of the patients as well as the parameters of the study are shown in (Table 1), there are 15 males and 28 females with mean age of 53±13 years.

Table 1: Characteristic data of the patients with glaucoma.

Variable	Value
Number of Patients	43
Age (Years)	53±13
Sexuality (Male, Female)	(15, 28)
Number of Eyes With Glaucoma	58
Family Heredity for Glaucoma	63%
Type of Glaucoma	
Open Angle	31
Close Angle	9
Pigmentary Glaucoma	1
Secondary To Medication	1
Secondary To Intraocular Lense	1
Topical Medications	
None	1
Dorzolamide	11
Timolol	20
Krikantek	8
Latanoprost	3
Gonioscopy	
Grade I	9
Grade II	0
Grade III	0
Grade Iv	34

IOP levels decreased significantly in the group treated with acupuncture ($p < 0.05$) demonstrating along with the pared t-test a confidence interval at 95%, (Table 2).

Table 2: Intraocular pressure control group and problem after 8 treatment sessions acupuncture therapy.

Parameter	Control		Acupuncture	
	Before	After	Before	After
Intraocular pressure right eye (mm/Hg)	23.21 ± 5.4	16.4 ± 2.9	24.3 ± 3.5	15.14 ± 2.01*
Intraocular pressure left eye (mm/Hg)	21.19 ± 3.9	15.96 ± 2.01	22 ± 2.7	14.93 ± 2.13*

* Paired t-test, $p < 0.05$.

DISCUSSION

Research has revealed that the glaucoma has increased and represents a great risk due to being asymptomatic, besides being the second cause of blindness in the world. It comes in asymptomatic so discomfort is only present at an advanced stage of the disease. The damages caused by it are irreversible representing thus a huge social problem. Currently the etiology of this entity is not well defined, but is attributed to lifestyle, food, hereditary familial background, although it is also due to some external causes such as the misuse of medications, badly performed surgeries, among others.

The hypothesis of the physiological mechanism of acupuncture to reduce IOP is that the stimulus made at specific points will act at the level of the blood vessels causing them to return to their normal vascular resistance and thus improving irrigation to the optic nerve, avoiding accumulation of toxic substances that may damage it; thus producing a normal performance in the operation of the ciliary muscle, allowing accumulated aqueous humor to flow steadily, avoiding intraocular pressure to increase and resulting in a normal vascular resistance, a proper functioning of the ciliary muscles and a constant flow of aqueous humour [14].

Current findings suggest that acupuncture may alter the vascular resistance in the short posterior ciliary artery, even if they are with medical treatments. The mechanism by which acupuncture may alter the movement of retro-bulbar vessels still isn't clear. However, it has been reported that the flow resistance in the eye is controlled by sympathetic and parasympathetic nerves; this is related to the release of nitric oxide or calcitonin, related to peptide gene. Vascular resistance and intraocular pressure levels in the short posterior ciliary artery were reduced [14]. These effects occur at the level of the psiconeuroimmunoendocrino system which is responsible for the adaptive and integrative responses to and from the environment that surrounds us. Each one of the systems that comprises the PNIE is able to communicate with each other and to act on itself (self-phase) through molecules called chemical mediators (hormones – interleukins - neurotransmitter). Although each of these systems uses a different code to communicate, all these chemical molecules are recognized by all systems since all possess receptors for them.

It is important to identify, recognize and integrate how to disease manifests in the individual; to order consistently different etiological factors causing it such as environmental factors and factors of the environment of the individual, agents involved for its modification, maintenance and/or disposal to explain mismatches that arise.

Idiosyncrasy is the way in which illness appears in each individual and social group; according to their vulnerability or susceptibility, it will determine the way the triggering factors will affect them. There are two basic responses vis a vis an alteration: the cortico-supra-renal, or passive response and the sympathetic adrenergic, or fight response. These bodily chemical responses are initially elaborated by each individual mental processes and, in turn, can broaden or limit the neuro-chemical and bodily response [13].

These affective, cognitive and psychosocial resources that generate thoughts, feelings and actions are called coping patterns, with them the person faces situations that alter him, if this answer is assertive in its implementation he definitely can adequately resolve the situation that arose from it, but if it is not, will then face a conflict in regular duration.

The individual as an open system is capable of being resilient to maintain its state of dynamic equilibrium or homeostasis due to the energy exchange, of matter and information with the medium since they have the property of auto-eco - organization in which have entries to retake the Middle elements to survive, keeping the interrelationships and emerging processes for the regulation process thus maintaining a state of well-being.

Under normal conditions, these four systems interact in harmony, resulting in a state of homeostasis. This homeostasis promotes a state of health or welfare and prepares the body for the constant struggle against the various internal and external factors that produce disease. A large number of factors involved in influencing those interactions, such as environmental, emotional factors, hereditary factors, personality traits and lifestyles, among others, it is a highly complex process [13].

Disease translates as loss in the homeostatic balance or some failure in the regulatory mechanisms that represent a disruption or disturbance in the processes of interaction of these four systems, such as onset of symptoms that typify a pathogenetic picture or a disease. The first system that is altered is the mental where lies the spiritual part of the individual manifesting by alterations in the will, intellect and feelings (emotions) being expressed by changes in its behavior and cognitive (modifications in the energy part). If the regulatory mechanisms are activated during this process and homeostatic (feedback and PNIE) returns to a State of well-being without major effects, otherwise if these mechanisms are not capable enough to perform its function be derived structural modifications (matter) producing consequences ranging from immediate to delayed represented by an acute illness, chronic and degenerative chronic and these in turn will result in effects within the subsystems that make up the environment of the individual.

The man is a unit consisting of a body, a spirit and a conscience, which can be considered healthy when all their feelings and reactions remain a balance between harmonic and controlled by energetic processes (which traditional Chinese medicine called “qi”). That energy enables the body react to pathogenic and exciting stimuli from the environment.

The use of therapeutic which reactivates the natural body defence mechanisms (neuroendocrine mechanisms and immune to that they are not just defence, but they are also mechanisms of recognition and maintenance), like acupuncture have structured models to analyze the individual from different subsystems comprising it to restore harmony, bioenergetics homeostasis and mechanisms natural regulatory body and thus the recovery of health. This therapy identifies the functional alteration (pathophysiology) prevalent according to pathological history of the individual. If the condition of the Fund is in the process of perception, response, nutrition, defense or cell production; jointly analyze disease-producing environmental factors [13].

From the point of view of traditional Chinese medicine liver is responsible for storage and regulation of the blood. Through the alternation of retention and propulsion of blood, the liver has a close relationship with all tissues of the human body.

The liver becomes the necessary link that allows transformation of yin and yang. Therefore the liver (wood) is the son of the kidney (water) and mother of the heart (fire). Expand and extend function should be manifest in the tissue area is under their control, such as tendons and muscles. As well as the kidney tissues positioned yin (deep, concrete, compact), such as the bones and marrow.

Eyes control vision and this concern not only with the structure of the eyeball, but also with the liver. Visual function of the eyes depends on the power of the blood from the liver. The Suwen explains “only on condition that the liver this full of blood, the eyes can see”; this quote tells us that vision capability depends directly on the quantity and quality of blood in the liver [15].

The excessive activity of the liver creates a hyperactivity of yang and brings it through the channel, creating fullness of fire on his head. Thus it can cause: tinnitus, headaches, glaucoma, hypertension, etc [16].

CONCLUSION

The present study implies the possibility that acupuncture is effective to lower the intraocular pressure in patients with glaucoma even with standard medication in the short-term and by means of the mechanism of action at the level of the psiconeuroinmunoendocrinologia may help decrease the concomitant symptoms that accompanied the increase in intraocular pressure.

ACKNOWLEDGEMENT

The authors are thankful to Mariana Mijangos-Gamiño for their contributions to this manuscript. We also give thanks to Elsa Nuñez-García for her assistance in translation of the manuscript.

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