

Efficacy of Acupressure on Intraocular Pressure in Elderly

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Abstract: *Background & Aims:* Elevated Intra-ocular Pressure (IOP) is one of the major risk factors for developing glaucoma. As age increases, intraocular pressure also increases, with an average of 0.28 mm Hg per decade. Lowering intraocular pressure (IOP) is the sole intervention proven to prevent the loss of sight from glaucoma. Optimal control of IOP decreases the risk of optic nerve damage and slows glaucoma progression. In this study, we aimed to evaluate the effect of acupressure on intraocular pressure in elderly. *Methods:* This study was carried out on a total number of twenty elderly volunteers of both sexes with age 60 to 70 years; They were chosen from outpatient clinic, El-Demerdash hospital, Ain shams university. This study was conducted from January 2019 to July 2019. All subjects received acupressure therapy (3 sessions /week, 20 minutes/per session for 8 weeks). Intraocular pressure was measured before and after treatment protocol application. *Results:* Using dependent sample t test revealed that there was significance decrease ($p < 0.05$) in intraocular pressure after the program in compared to before program. *Conclusion:* From the results of the study; it can be concluded that subjects received acupressure therapy has significant decrease in intraocular pressure. So, we can protect elderly from the risk of optic nerve damage and loss of sight from glaucoma.

Key words: Intraocular Pressure • Glaucoma • Acupressure Therapy • Optic Nerve • Elderly

INTRODUCTION

Old age is an age group or generation comprising a segment of the oldest members of a population. The social aspects of old age are influenced by the relationship of the physiological effects of aging and the collective experiences and shared values of that generation to the particular organization of the society in which it exists. In many countries, including Japan, the elderly are defined as having a chronological age of 65 years or older. However, there is no clear medical or biological evidence to support this definition [1].

Intraocular pressure (IOP) is the tissue pressure of the intraocular contents. The normal range for IOP is 10-21 mm Hg and is maintained at this level throughout life and between the sexes, though there is some diurnal and seasonal variation. Control of IOP within the correct

physiological range is necessary to maintain the anatomical conditions necessary for optimal refraction and vision [2].

Elevated Intra-ocular Pressure (IOP) is risk factors for developing glaucomatous optic neuropathy. Glaucoma is a common condition in ophthalmology worldwide and it is a leading cause of visual loss which leads into reduced economic and social status and premature death [3]. Intraocular pressure elevates 0.28 mmHg every 10 years. Knowledge of the normal range of intraocular pressure in various age groups will help glaucoma screeners [4].

Clinical trials have shown that the optimal control of IOP decreases the risk of optic nerve damage and slows glaucoma progression. Lowering IOP is the sole intervention proven to prevent the loss of sight from glaucoma [5].

Acupressure is a specific type of massage that relies primarily on using the thumbs, fingers and palms to apply pressure to various points on the body. Therapists may use various rhythms, pressures and techniques in the practice. Shiatsu massage is a style of acupressure therapy [6,7]. The aim of this study was to explore the effect of acupressure in elderly.

Sometimes pressure is needed at these points to clear up blockages and help ensure a healthy, balanced and harmonious flow of energy through the meridians [8].

MATERIAL AND METHODS

Study Design: The study was designed as a prospective, pre-post-test, single group.

Participants: The study included twenty elderly volunteers of both sexes volunteers with normal intraocular pressure with age range between 60-70 years old. They were recruited from outpatient clinic, El-Demerdash hospital, Ain shams university, Egypt. A written informed consent was signed prior to the study. Also, the study was reviewed and was approved by Ethics committee of faculty of physical therapy, Cairo University. All of the subjects included in the study had normal blood pressure and their blood glucose level was within the normal level.

Patients with glaucoma, systemic hypertension, diabetes mellitus and Uncooperative subjects were excluded from the study. Also, patients who had a history of smoking or alcohol abuse and patients with uncontrolled blood glucose level were also excluded from the study. Initial medical screening was performed for each volunteer by the physician and history was documented for all volunteer. The purpose, nature and potential risks of the study were explained to all participants, who were asked to maintain their pharmacological treatment, regular diet and normal daily activities and lifestyle throughout the study.

Outcome Measures: All subjects in the study were evaluated by mercury sphygmomanometer with using a stethoscope to measure blood pressure, to exclude undiagnosed hypertensive subject. Gluco-check (one touch life scan) to check blood glucose levels, to exclude undiagnosed diabetic subjects. Also; their weight and height were recorded using weight and height scale

to calculate the body mass index (BMI) for each patient and additionally; Goldman applanation tonometer was applied to each subject for measuring intraocular pressure for both eyes. Tonometry is the method eye care professionals use to determine intraocular pressure. Most tonometers are calibrated to measure pressure in millimeters of mercury (mmHg).

Intervention: Twenty subjects Received Acupressure therapy (3 sessions /week, 20 minutes/per session for 8 weeks) where intraocular pressure is measured before and after treatment protocol application. Acupressure is a specific type of massage that relies primarily on using the thumbs, fingers and palms to apply pressure to various points on the body. Acupressure points- or acupoints - are locations on the body where chi may become congested or completely blocked. Acupressure massage is a natural holistic technique to address blockages that may be causing additional health problems. Before starting the study, the following tasks were performed: The purpose and procedures of the study protocol were explained in detail for each subject before the initial assessment. The explanation should be brief and in simple terms.

Before starting the program; a complete medical history was taken. The subject was instructed not to eat heavy meal for at least two hours before the program. Before the start of session, one familiarization session was designed to habituate participants. All the parameters were recorded at the beginning and the end of the total study period. The blood pressure measurement is taken to all subjects in supine lying position by using stethoscope and mercury sphygmomanometer. Intraocular pressure was measured for both eyes using tonometer. The intraocular pressure was measured before and after the study.

Program: Acupressure performed when subject relaxed, subject was sitting when administering acupressure. To do this, hold the point with steady pressure. To get the full effect of acupressure, press for at least 2-3 minutes. After holding the pressure point for the desired amount of time, slowly release the point. The gradual pressing and releasing of pressure points help make the treatments more effective. Acupressure was applied to four points: inner edge of the eye, medial aspect of eye brow, lateral side of the eye and point at the base of the skull.

Statistical Analysis: Results were expressed as mean \pm standard deviation (SD). Pair-wise comparison (pre- versus post-assessment) within the same group for dependent variable was performed using paired t test in normally distributed data. Statistical Package for Social Sciences (SPSS) computer program (version 19 windows) was used for data analysis. P value \leq 0.05 was considered significant.

RESULTS

The current study was conducted on 20 subjects. Regarding the age of the subjects, it was 63.95 \pm 3.137 years. The mean weight was 87.0 \pm 8.83 kg. Regarding height, it was 176.65 \pm 5.906 cm. The mean BMI was 27.63 \pm 2.56. Regarding random blood sugar, the mean was 101.05 \pm 14.01 mg/dl as shown in Table 1. Regarding gender distribution the men: women ratio was 65%:35%.

Within group comparison, the mean intraocular pressure was 15.75 \pm 4.102 mmHg. Before acupressure program and was 14.65 \pm 3.843 mm hg after the program. Using dependent sample t test, there was a significant decrease in intraocular pressure before and after the program as shown in Table 2.

DISCUSSION

Clinical trials have shown that the optimal control of IOP decreases the risk of optic nerve damage and slows glaucoma progression. Lowering IOP is the sole intervention proven to prevent the loss of sight from glaucoma. In this study, we aimed to evaluate the effect of acupressure on intraocular pressure in elderly. The current study was conducted on 20 subjects.

In agreement with this study; Her JS *et al.*, 2010 studied thirty-three patients with glaucoma. These patients were divided into the auricular acupressure group (16 patients, 28 glaucoma eyes) and the sham group (17 patients, 32 glaucoma eyes) [9].

Patients in the acupressure received auricular acupoint (kidney, liver and eye) stimulator tapping and regular massage twice a day for 4 weeks. Patients in the sham group received tapping at sham auricular acupoints (wrist, shoulder and jaw) without massage stimulation. The IOP and visual acuity (VA) were assessed before and after the treatment in the first 4 weeks and followed up, up to 8 weeks [10].

After the treatment and at the 8-week follow-up, IOP and VA improved significantly in the acupressure group when compared with pretreatment ($p < 0.05$). The most

Table 1: Physical characteristics of subjects

Items	Mean \pm SD*
Age (Years)	63.95 \pm 3.137
Body Mass (Kg)	87.0 \pm 8.83
Height (Cm)	176.65 \pm 5.90
BMI kg/cm ²	27.63 \pm 2.56
RBS mg/dl	101.0 \pm 14.01

*SD: standard deviation, BMI: Body mass index, RBS: Random blood sugar.

Table 2: Difference in intraocular pressure pre and post procedure

	Mean \pm Std. Deviation	t- value	P - value
Before	15.75 \pm 4.102	4.222	.0001 ^{HS}
After	14.65 \pm 3.843		

P < 0.05 = significant, HS P < 0.01 = highly significant, P = Probability.

significant IOP-lowering effect was seen at about 3-4 weeks after auricular acupressure. IOP returned to the initial level after acupressure had been discontinued for 4 weeks. Significant improvement of the uncorrected visual acuity (UCVA) was noted at about 2-4 weeks in the acupressure group. UCVA improvement was also noted in the sham group. The difference was only significant in week 3. Improvement of the best-corrected VA was noted in both groups, but was only significant in week 2 [11].

Also in agreement with this study; Teh-Ching Chu *et al.* 2002 found that initially, the effects of acupuncture without electrical stimulation on IOP were investigated. After inserting acupuncture needles up to one hour, there was appreciable change of 3.8 \pm 0.6 mmHg in IOP at 2 hours [12].

In disagreement with this study, Geraldo Magela Vieira *et al.* [13] studied a group of 25 volunteers fulfilled the inclusion criteria for joining the initial phase of this research. All of them were healthy without glaucoma. They were asked to lift an 85% top load in the supine position for 8 times. IOP was measured before and after the exercise.

A small, but significant IOP decrease (1.61 mmHg) was obtained after exposing 25 individuals to a specific physical effort. This may be attributed to that he included in his study healthy young volunteers and his use of Perkins' manual applanation tonometry which is a valuable instrument in clinical and laboratorial IOP measurements, small alterations are inherent in the subjective character of this method [13].

There are some limitations that include short duration of follow up and the mechanism explaining the findings of this study. Also, the control group not be used.

It can be concluded, based on this study finding; that individual who received acupressure therapy had significant decrease in intraocular pressure. So; this therapy can be of great value for patients with glaucoma.

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