

Study on the effectiveness of massage therapy for eyestrain syndrome

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Abstract: This study examined the effectiveness of massage therapy for eyestrain syndrome. This study was a randomized controlled trial involving two groups. Sixteen individuals provided with eyestrain written informed consent for participation in the study. The intervention massage group included 8 participants, and the control group included 8 participants. The subjects performed eyestrain-inducing load work by computer input for 30 min, and the intervention was then performed. For participants in massage group, the therapist massaged the neck and shoulders, temporal region, and orbital area for 20 min. The participants in control group rested untreated for 20 min in the supine position with eyes closed. The degree of eye strain decreased (VAS) by 30.3 mm in massage group and 31.8 mm in control group; a significant decrease was observed in massage groups and control ($P < 0.05$). The pulse decreased by 5.9 bpm in massage group and 0.1 bpm in control group; a significant decrease was noted only in group massage ($P < 0.05$). A 20-min, comfortable massage for asthenopia syndrome has been shown to improve the degree of eyestrain.

Keywords: massage, eyestrain syndrome, visual display terminals, randomized controlled trial, visual analog scale

1. Introduction

In recent years, fatigue and eyestrain associated with the use of visual display terminals (VDT) have become increasingly prevalent among Japanese people. Longer VDT operation times result in increased stress and fatigue in different body regions, such as tired eyes and eye pain, stiffness in the shoulders and neck, and lower back pain. It has been reported that approximately 90% of the Japanese population has eyestrain, making it one of the factors that lowers their quality of life¹⁾.

Massage is generally used to improve physical and mental fatigue. Massage therapies are expected to contribute to the treatment of eyestrain. There are few studies on the effectiveness of massage therapy for eyestrain syndrome.

The aim of this study is to examine the effectiveness of massage therapy for eyestrain syndrome.

2. Method

2.1. Design & Setting

This study was a randomized controlled trial involving two groups: participants who received or did not receive massage therapy. The study administrator assigned a random numerical code to participants to mask their identities. The study was conducted at the Tsukuba University of Technology, Center for Integrative Medicine West Wing, Japan, Ibaraki. This study was approved by the appropriate ethics committee.

2.2. Participants

Sixteen individuals provided with eyestrain written informed consent for participation in the study. The intervention (massage) group (group M) included 8 participants, and the control group (group C) included 8 participants.

2.3. Intervention

The subjects performed eyestrain-inducing load work by computer input for 30 min, and the intervention was then performed. For participants in group M, the therapist massaged the neck and shoulders, temporal region, and orbital area for 20 min. The stimulus intensity was set to the extent that the study subjects perceived "comfort." The procedure mainly consisted of kneading and compression with the thumb and four fingers. The participants in group C rested untreated for 20 min in the supine position with eyes closed.

2.4. Outcome measures

The outcomes were the degree of eyestrain (100-mm visual analog scale value), pulse rate, visual acuity (Landolt broken ring chart), flicker value, blood oxytocin value, and salivary amylase value. Measurements were acquired before and after the intervention.

2.5. Statistical Analysis

A statistical comparison was conducted of the changes in each parameter value before and after the intervention in groups M and C. The Wilcoxon signed rank sum test was used for statistical analysis. Values are expressed as means \pm standard deviations (SD). The blood oxytocin value was shown as a rate of change with 100% before the intervention. All statistical analyses were performed with SPSS ver. 18 (IBM Japan, Tokyo, Japan). A p-value of <0.05 was considered significant.

3. Results

The degree of eyestrain decreased by 30.6 mm in group M and 31.7 mm in group C; a significant decrease was observed in groups M and C ($P < 0.05$). The pulse rate decreased by 5.9 bpm in group M and 0.1 bpm in group C; a significant decrease was noted only in group M ($P < 0.05$). We found no significant differences on other outcome measures (visual acuity, flicker value, blood oxytocin value, and salivary amylase value) between groups M and C ($P > 0.05$).

Table 1. Outcomes before and after the intervention

	Groups M (n=8)			Groups C (n=8)			
	Pre	Post	P Value	Pre	Post	P Value	
The degree of eyestrain (VAS; mm)	46.0 \pm 26.4	15.4 \pm 10.7	<0.05	61.1 \pm 23.3	29.4 \pm 21.0	<0.05	
The pulse rate (bpm)	70.3 \pm 14.5	64.5 \pm 13.7	<0.05	62.5 \pm 8.1	62.4 \pm 8.8	N.S.	
Visual acuity (Landolt broken ring chart)	(Rt)	1.09 \pm 0.47	1.14 \pm 0.58	N.S.	1.18 \pm 0.36	1.18 \pm 0.27	N.S.
	(Lt)	0.95 \pm 0.48	1.16 \pm 0.53	N.S.	1.19 \pm 0.45	1.31 \pm 0.45	N.S.
Flicker value (Hz)	(UP)	35.4 \pm 3.9	35.8 \pm 2.9	N.S.	33.6 \pm 1.9	35.4 \pm 3.9	N.S.
	(DOWN)	38.8 \pm 3.8	38.1 \pm 3.8	N.S.	38.3 \pm 3.8	38.1 \pm 3.8	N.S.
Blood oxytocin (Rate of change;%)	100.0 \pm 0.0	177.0 \pm 168.2	N.S.	100.0 \pm 0.0	144.8 \pm 122.8	N.S.	
Salivary amylase value (KU/L)	48.1 \pm 27.8	42.0 \pm 21.9	N.S.	34.9 \pm 16.0	40.4 \pm 28.4	N.S.	

4. Discussion

We found that 20 minutes of massage after eyestrain-induced loading work reduced the degree of eyestrain and reduced heart rate compared to rest. The effects of massage on heart rate and blood pressure have been clarified in previous studies using anesthetized rats²⁻⁴). Non-noxious massage-like stimuli to the skin have been shown to suppress heart rate and blood pressure. In particular, it has been confirmed that the 5-minute massage-like stimulation to the abdomen reduced the heart rate and blood pressure compared to before the stimulation. On the other hand, it has been clarified that noxious mechanical stimulation causes an increase or decrease in reflexes of heart rate and blood pressure in anesthetized rats and anesthetized cats. In short, these studies show that heart rate and blood pressure responses differ depending on the intensity of massage and the site of stimulation. Furthermore, these reactions have been shown to involve autonomic nerves.

Therefore, the comfortable massage performed in this study may affect the autonomic nerves and reduce heart rate. It is also considered to have affected the subjective eyestrain. On the other hand, 20 minutes of rest reduced subjective eyestrain, but there was no significant difference in pulse rate. We cannot clarify from this study whether 20 minutes of rest had less effect on the autonomic nervous system than massage. This study has various limitations. The sample size for this study is very small. It is possible that the timing of blood and saliva collection has not been taken into consideration. These limits will be the subject of future research.

Disclosure Statement of COI

The authors have no financial conflicts of interest disclose concerning the study.

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