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ORIGINAL RESEARCH

The influence of Positional Release Therapy on the myofascial trigger points of the upper trapezius muscle in computer users

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KEYWORDS
Positional Release Therapy;
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Summary *Objective:* The purpose of the present study was to investigate the effect of Positional Release Therapy (PRT) in computer users via latent trigger points (LTrPs) of the upper trapezius muscle.
Materials and methods: Twenty-eight women with the upper trapezius MTrPs participated in this study. Subjects were randomly classified into two groups (14 in each group): the subjects in the Group 1 received PRT in shortened position while those in the group 2 received sham control in the neutral position of the upper trapezius muscle. They received three therapy sessions every other day for one week. The local pain intensity and Pressure pain threshold (PPT) were measured via Visual Analogue Scale (VAS) and algometry, respectively, before interventions and repeated 5 min after the first and third treatment sessions in each group.
Results: One-way ANOVA was used for data analysis. After treatment, between groups comparison revealed that for PPT and VAS, there were significant differences between the two groups (VAS and PPT; $P < 0.05$).
Conclusion: Both groups (PRT and sham control) showed alleviation of pain and increase in PPT during three sessions of therapy although PRT showed to be more effective in these patients.

Abbreviations: PRT, Positional Release Therapy; LTrPs, latent trigger points; PPT, Pressure pain threshold; VAS, Visual Analogue Scale.

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Introduction

Work-related Musculoskeletal Disorders (WRMSDs) are also known as Repetitive Strain Injury (RSI) and Cumulative Trauma Disorder (CTD) (Yassi, 1991; Yassi, 2000). As witnessed in the literature, etiology for WRMSDs symptoms is complicated, yet researchers have named multiple factors that are significant in its development such as psychosocial, organizational, and individual aspects of job satisfaction and workplace climate (Ranasinghe et al., 2011; Piranveyseh et al., 2016), as well as gender. WRMSDs have high prevalence in women than in men, probably due to women's musculoskeletal susceptibility (Yap, 2007; Hakala et al., 2012). The disorders related to computer-based activities can increase compressive loadings in the spine and create a creep response in the tissue and so subsequently cause pain symptoms and muscle strain in different parts of the body; in upper extremity the highest prevalence of MSDs was found in the neck and shoulder (49.0%) regions (Jensen et al., 2002; Wahlström, 2005; Trester et al., 2006; Tulder et al., 2007; Piranveyseh et al., 2016). These investigations are significant with regard to developing prevention strategies, as these problems can directly and/or indirectly affect individual lives and societies, for example, by affecting the quality of life, leading to increase in absences at work and consequently economic burdens (Szeto et al., 2002; Wahlström, 2005; Staal et al., 2007; Akrouf et al., 2010). Among MSDs associated with neck and shoulder, the upper trapezius is the most involved muscle in office workers, especially intensive computer users. Fischer measured the PPT of eight different muscles using a pressure algometer and found that the upper trapezius was the most sensitive muscle tested (Fischer, 1987; Rempel et al., 2006; Trester et al., 2006).

During work continuous exposure to video display units together with inappropriate work stations (stressful environment) and prolonged static or awkward/non-neutral body posture, accompanied by inadequate rest breaks, leads to ischemia, hypoxia, and subsequently fatigue in muscle tissues. This gradual activation of muscles might lead to developing trigger points in the trapezius muscles and can account for higher rates of musculoskeletal complaints even with low level static exertions (Trester et al., 2006; Hoyle et al., 2011; Lari et al., 2016); It was therefore was hypothesized that both postural and visual demands may play roles in muscle activation patterns, resulting in chronic musculoskeletal disorders (Buckle and Devereux, 2002; Trester et al., 2006). There are two categories of Trigger points (TPs): active and latent, the active trigger points feature local or referred pain away from the trigger point, while latent trigger points do not cause spontaneous pain unless evoked by an external stimulant (Simons et al., 1999). Ibarra et al. (2011), showed that LTrPs are associated with reduced efficiency of reciprocal inhibition, which may contribute to unbalanced muscle activation, so elimination of LTrPs and/or prevention of LTrPs to become active may improve motor unit functions and may prevent development of local pain and decreases central sensitization (Ibarra et al., 2011). A variety of treatments have been introduced to relieve the musculoskeletal complaints and symptoms associated with MTrPs through noninvasive and invasive treatments such as Ischemic Compression, Manual Pressure Release, Strain Counter Strain, Muscle energy technique, Massage, Spray and Stretch, Electrical Stimulation, and injections with local anesthetics, corticosteroids, or botulism toxin or dry needling (Prentice, 2004; Richards, 2006; Yap, 2007; Chaitow, 2009; Okhovatian et al., 2012; Mehdikhani and Okhovatian, 2012; Kamali Sarvestani et al., 2013; Cagnie et al., 2013; Lari et al., 2016). The previous systematic review studies have shown that one of the essential treatments in the management of LTrPs is Manual Therapy (MT) and several studies have shown that MT treatments make no significant difference in comparison with a placebo (Fernandez et al., 2005). However, MT techniques are less costly, with least side effects in treatment of MTrPs, but there is a lack of evidence about the efficacy of these methods or a comparison of treatment to suggest the best technique. The intervention used in the present study was PRT. It is an indirect and passive therapeutic technique that uses TrPs. The application of PRT is a safe and effective method to successfully treat elicited MTrPs. In this technique, in order to facilitate restoration of normal tissue length and to treat excessive muscle tension or spasm, tissues are placed in a Position of comfort for a brief period (90 s) to resolve the associated dysfunction. PRT, in the shorten position, decreases gamma and alpha neuronal activities and resets the muscle spindle mechanism of the affected tissue, and thus helps improvement in vascular circulation and removal of the chemical mediators of inflammation (Speicher and Draper, 2006; Al-shawabka et al., 2013; Singh and Chauhan, 2014).

Despite the high prevalence of MPS and all the research done on MPS, the clinical efficacy of PRT has not been well established. The aim of the present study was to investigate the effect of PRT on pain intensity and pain pressure threshold in computer-using females with latent trigger points in upper trapezius muscle at work place.

Methodology

Design and subject selection

In the present randomized, single-blind study, twenty-eight female office workers, aged between 19 and 45, with latent TrPs of upper trapezius muscle were selected from a clinic affiliated to Shahid Beheshti University of Medical Science, Tehran Iran. The study was conducted between June—Oct 2015. The research proposal was approved by the ethical committee of Physiotherapy Research Centre (PTRC), Shahid Beheshti University of Medical Sciences. A diagnosis of latent MTP was confirmed after manual palpation and patient feedback (Simons et al., 1999). Prior to randomization, the group allocation scheme was successfully concealed from the subjects. Once patients were determined to meet the requirements of the study and signed the informed consent form, after the first evaluation session, they were asked to pick one of the 28 papers from inside an envelope: 14 papers had number 1 printed on them and the other 14 had the number 2. The papers had previously been shuffled into the envelope. The paper picked determined each subject's grouping: 1 for treatment group and 2 for sham control group. Both groups were