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Physical Therapy and Manual Therapy for Prevention and Rehabilitation of Cervical Myofascial Pain and Headache, due to Spine Malposition in Users (Abusers) of Smart Phones

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Abstract

Introduction: Ultimately, the introduction of portable devices in the everyday life imposed the necessity to evaluate the possible consequences (of the abuse) on the position of the spine and correspondent structures of the nervous system. Medical specialists are responsible for the construction of programs for prevention of these consequences.

The goal of the current article is to evaluate the impact of physical therapy and manual therapy in the treatment and the prevention of cervical myofascial pain and headache, due to spinal malposition in users (abusers) of smart phones.

Materials and methods: We observed a total of 69 patients with cervical myofascial pain and headache. The age of the patients was between 19 and 49 years, with posture (position) alterations of the cervical spine, but without significant cervical pathology. All patients used a mobile device in their everyday activities (minimum 2 h daily) for at least 6 months.

Functional evaluation was effectuated before, during and after treatment and one month after the end of the rehabilitation.

In all patients we applied a complex physical-therapeutic program, including analytic exercises for paravertebral muscles and soft tissue techniques [massages, post-isometric relaxation (PIR) for the respective upper trapezius and sterno-cleido-mastoideus muscle] and stimulation of patients' active participation in the process of prevention (education in principles of back-school, self-massage, auto-PIR). The patients in the first group effectuated only these procedures. In the second group we added elements of manual therapy (tractions, mobilizations, manipulations; and auto-mobilizations).

Statistical evaluation was performed by SPSS program, version 17; using t-test (analysis of variances ANOVA) and Wilcoxon rank test (non-parametrical correlation analysis).

Results and analysis: All patients reported a significant decrease in the intensity of cervical pain and headache (evaluated by Visual analogue scale of pain and by pressure dolorimetry). In all patients we observed amelioration of the static position of the cervical spine, reduced amount of paravertebral muscle spasm and of the sensibility of trigger and tender points; and augmentation of range of active motion of the cervical region of the spine. During the rehabilitation period the results were most important in the second group (with manual therapy), but one month later there is not statistical differences between both groups.

Discussion and conclusion: Techniques of physical therapy and manual therapy are very useful for the prevention and the rehabilitation processes of cervical myofascial pain and headache. The program of care includes active (analytic) exercises, PIR and stretching techniques, tractions and mobilizations, education of the patient, and (in some cases) manipulations. We consider that every medical doctor - specialist in Physical and rehabilitation medicine and every physical therapist must adapt the general algorithm to the needs of the concrete patient.

Keywords: Physical therapy; Manual therapy; Myofascial pain; Cervicogenic headache; Tension type headache; Kinesiological analysis

Introduction

Ultimately, the introduction of portable devices in the everyday life imposed the necessity to evaluate the possible consequences (of the abuse) on the position of the spine and correspondent structures of the nervous system. Medical specialists are responsible for the construction of programs for prevention of these consequences.

Cervical myofascial pain, cervicogenic and tension-type headache are between the top 10 causes for reduction of the quality of life of the modern 'healthy' citizen. These conditions are in the field of interest of different type of medical and paramedical staff: medical doctors; physiotherapists, psychologists, manual therapists, etc. [1-3]. Patients suffering from these pathologies are treated by general practitioners or by specialists in Neurology, Rheumatology, Orthopaedics and Traumatology, Physical and Rehabilitation medicine /PRM/, etc.

A lot of authors consider that the origin is located in the malposition or the static alteration of the cervical spine (especially the first levels – atlanto-occipital and the atlanto-axial joints, and surrounding structures).

Objective

The goal of the current article is to effectuate a quantitative and

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qualitative evaluation of the impact of physical therapy and manual therapy in the treatment and the prevention of cervical myofascial pain and headache, due to spinal malposition in users (abusers) of smart phones.

Design of the Study

Current randomized study was performed during the last 2 years in 69 out-patients of an ambulatory medical center in Sofia (in the PRM department). After a signed informed consent all patients received a rehabilitation complex of 3 weeks (15 procedures, 5 times weekly) with correspondent examinations and evaluations before (before T h), during (week 2), at the end of rehabilitation (after Therapy) and one month later.

Materials

We observed a total of 69 patients with cervical myofascial pain and headache. The distribution of patients M:F is presented in Figure 1. The age of patients was between 19 and 49 years (Figure 2). All patients use a mobile device in everyday activities (minimum 2 h daily) for at least 6 months.

All patients presented an important vertebral syndrome with paravertebral muscular spasm, paravertebral and pericranial tenderness, posture deviation (malposition) of the cervical spine (cervical hypo-lordosis), reduction of the active and passive range of motion of the cervical spine (predominantly of the extension and rotation, in some cases – adding the latero-flexion). In a lot of patients we observed functional blockages (level 2 of Stoddart) in cervical intervertebral joints and at the cervico-thoracal transition level (C7-Th1). Realized radiological investigations don't demonstrate significant spinal pathology of the cervical region (X-ray, CT, MRI). We do not detect signs and symptoms of radiculopathy (clinical exam and EMG investigation).

Before the rehabilitation course a lot of patients received a neurological diagnosis of the headache, according the International Classification of Headache disorders (3rd edition, beta version, 2013) [4]: tension-type headache (2.TTH, associated with pericranial tenderness: 2.1.infrequent or 2.2.frequent episodic TTH or 2.3.chronic TTH) or cervico-genic headache (11.2.1.); with appendix diagnosis headache, attributed to cervical myofascial pain ((A 11.2.5.). The distribution TTH versus cervicogenic headache (38 patients TTH: 31 patients with cervicogenic) is presented in Figure 3.

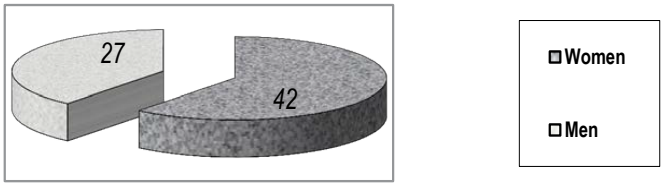

Figure 1: Distribution of patients (M:W).

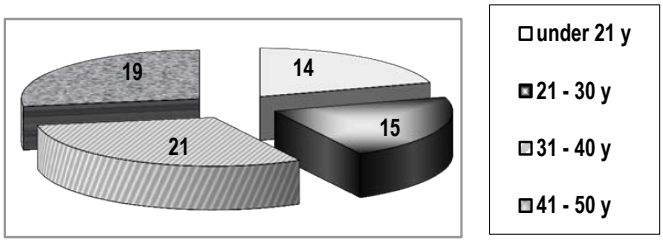

Figure 2: Distribution of patients (age).

Methods

The rehabilitation program was performed by 15 procedures, distributed in three weeks (5 times weekly, 60 min/day).

In all patients we applied a complex physical-therapeutic program, including analytic exercises for the paravertebral muscles; soft tissue techniques [massages, post-isometric relaxation (PIR) for the respective upper trapezius and sterno-cleido-mastoideus muscles] and stimulation of patient's active participation in the process of prevention (education in principles of back-school, prevention of static and dynamic alterations of the spine; self-massage, auto-PIR).

The patients of the first group effectuated only these procedures.

In the second group we added elements of manual therapy (tractions, mobilizations, manipulations; and auto-mobilizations).

Functional evaluation was effectuated before, during and after treatment and one month after the end of the rehabilitation course.

Statistical evaluation was performed by statistical package SPSS, version 17; using options of two samples comparison; with parametrical analysis of variances (ANOVA) and non-parametrical correlation analysis: t-test (t-criterion, p-value); Signed test, Signed rank test, Mann-Whitney (Wilcoxon) test (W median). We consider values of p under 0.05 like statistically significant; in some cases we receive $p<0.01$.

Results and Analysis

All patients reported a significant decrease of intensity of the cervical paravertebral pain and the headache (evaluated by Visual analogue scale of pain 0-10 and by pressure dolorimetry – Figures 4 and 5). In all patients we observed amelioration of the static position of

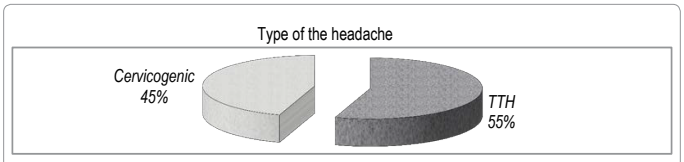

Figure 3: Distribution of the headache of patients: tension-type headache or cervicogenic headache.

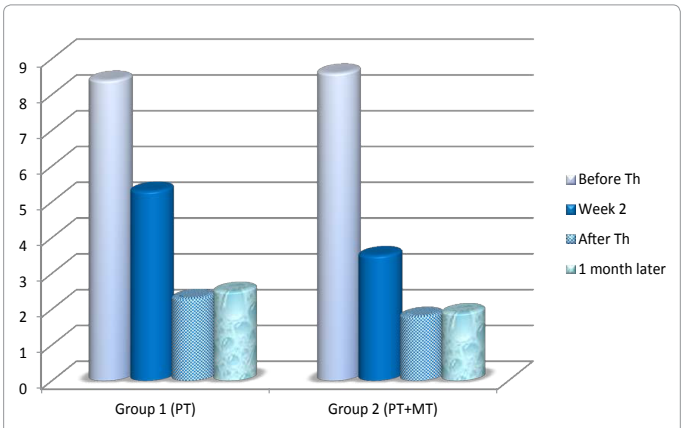

Figure 4: Visual analogue scale of pain (0-10).

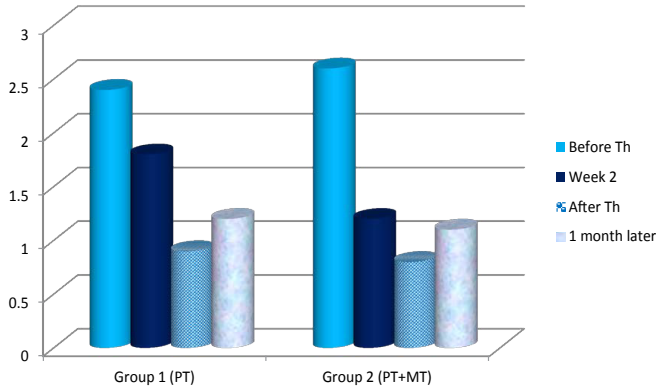

Figure 5: Dolorimetry - paravertebral and pericranial tenderness (0-3).

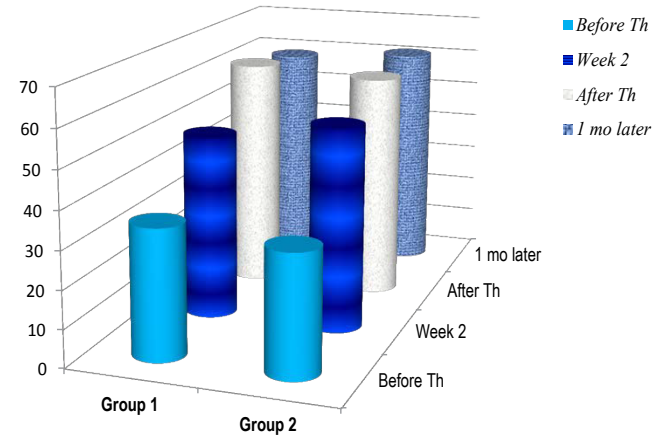

Figure 6: Goniometry of cervical spine – Extension.

the cervical spine, reduction of the paravertebral muscle spasm (Figure 6) and of the sensibility of trigger and tender points; and augmentation of range of active motion of the cervical region of the spine (Figure 7). During the rehabilitation period the results were most important in the second group (with manual therapy), but one month later there is not statistical differences between both groups.

Discussion

Our work categorically proves the necessity of application of physical therapy in cases with cervical myofascial pain and headache, due to static alterations. Our results demonstrate the positive effect of physical and manual therapeutic techniques on paravertebral and pericranial pain, muscular tenderness, and range of motion of the cervical part of the spine.

The influence of techniques ameliorating the static and dynamic dysfunctions of the high levels of the cervical region proves the

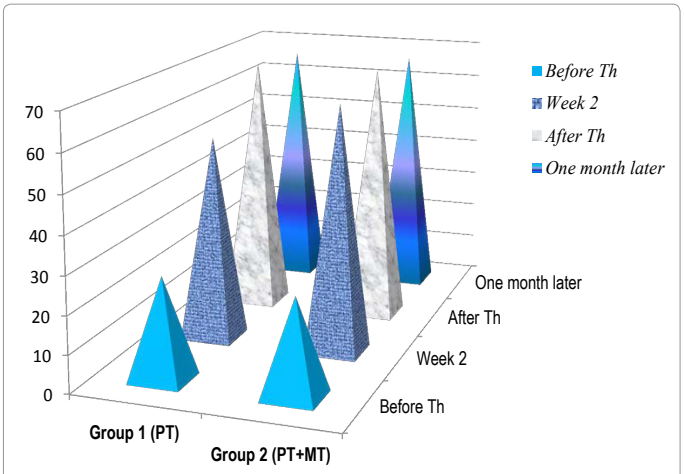

Figure 7: Goniometry of cervical spine – Rotation of the altered side.

dominant role of the upper cervical spine in the generation of this type of back pain and headache [5-7]. We consider that the impact of the upper cervical region is determinant not only for the generation of the so called cervicogenic headache, but too - for the initiation and the aggravation of tension-type headache.

The stabilization of the effect one month after the end of rehabilitation is due principally to the efficacy of patients' education.

Conclusion

Techniques of physical therapy and manual therapy are very useful for the prevention and the rehabilitation process of cervical myofascial pain and headache. Our program of care includes active (analytic) exercises, PIR and stretching techniques, tractions and mobilizations, patient's education and (in some cases) manipulations. We consider that every medical doctor - specialist in Physical and rehabilitation medicine and every physical therapist must adapt the general algorithm for the needs of the concrete patient.

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