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MYOFASCIAL PAIN OF THE HEAD AND NECK AMONG CROATIAN WAR VETERANS TREATED FOR DEPRESSION AND POSTTRAUMATIC STRESS DISORDER

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SUMMARY

Background: *During the Croatian War of Independence, 1991-1995, Croatian soldiers were exposed to traumatic and stressful events. Certain number of soldiers who took part in the war, developed depression and posttraumatic stress disorder (PTSD). Stress is one of the etiological factors in the development of myofascial pain (MPS), although the mechanism of these processes is not entirely understood. The aims of this study were to determine the frequency of myofascial pain among Croatian war veterans with depression and PTSD, association between MPS and severity of depression, to describe the most common locations of trigger points in the region of head and neck, and to find out if there is any association in frequency between MPS and endotracheal intubation.*

Subjects and methods: *A total of 101 Croatian war veterans suffering from PTSD and depression participated in the current study. Diagnosis of myofascial pain was based on detailed anamnestic history and careful clinical examination.*

Results: *Our findings showed a high rate of myofascial pain among Croatian war veterans, with occipital region and right temporal region as the most common places of trigger points. Higher severity of depression was accompanied by a higher percentage of subjects with MPS. Finally, there was no significant association between endotracheal intubation and development of MPS among the war veterans.*

Conclusions: *It can be concluded that the rate of myofascial pain among Croatian war veterans is high and therefore it must be considered in patients with depression and PTSD. Moreover, the severity of depressive symptomatology seems to be related to the presence of myofascial pain.*

Key words: *myofascial pain - trigger points – depression – PTSD - war veterans*

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INTRODUCTION

Myofascial pain syndrome (MPS) is a muscular disorder characterized by chronic pain and by the presence of trigger points (TP). TPs are defined as hypersensitive spots localized within a muscle; they can be active or latent. When TPs are activated, they can produce pain on the site of activation, referred pain and muscular dysfunction (Manolopoulos et al. 2008, Hamamoto et al. 2009). The head and neck region is considered a high frequency area for developing MPS. Studies over last decades resulted with improvement of our knowledge of MPS, yet the exact number of etiological or pathophysiological aspects remain unclear.

Emotional stress is considered to be one of etiological factors in the development of MPS. Although the mechanisms of these processes are not entirely known, increased activity of the central nervous system (CNS) initiated by emotional stress through complex interactions in the CNS, results with prolonged and painful muscular tension (Wall & Melzack 1999). During the Croatian War of Independence, 1991-1995, Croatian soldiers were exposed to traumatic and stressful events. As a result of the exposure to war stress, a certain number of soldiers who took part in combat developed depression and posttraumatic stress disorder (PTSD), which are classified in the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV). Depression presents as a mood disorder that causes a persistent feeling of sadness and loss of interest often accompanied with: depressed mood, decreased interest, change in weight, sleep and activity, fatigue, guilt, concentration problems, and suicidality. Severity of depressive episode can be: mild, moderate and severe. PTSD presents a pathological response to an extreme stress situation that involves direct personal experience. Usually, it is followed by symptoms such as re-experiencing of the traumatic event, increased responsiveness to stimuli, nightmares, sleeplessness and avoidance of situations related to the traumatic experience and increased muscular tension (American Psychiatric Association 1994). In more severe forms, PTSD can even promote suicidal behaviour (Jaksic et al. 2015, Kusevic et al. 2015). Combined, depression and anxiety disorder such as PTSD can lead to development of MPS. On the other

hand, MPS can increase patient's anxiety, resulting with a vicious circle (Okeson 1998, Simons 1999).

The aims of this study were to determine the frequency of MPS among Croatian war veterans with depression and PTSD, association between MPS and severity of depression, to describe the most common locations of TPs in the region of head and neck, and to describe the association between endotracheal intubation and MPS. We hypothesized that the prevalence of MPS is high in patients with depression and PTSD.

SUBJECTS AND METHODS

The sample consisted of 101 male patients with depression and PTSD (mean age = 47.22 years, range = 33-73 years), out of which 17 had a history of endotracheal intubation and surgery; all examined subjects participated in the Croatian War of Independence. Their diagnosis of depression and PTSD was in accordance with DSM-IV. All participants were patients at the Psychiatric Hospital Vrapče, Zagreb, Croatia, treated with standard therapy for depression and PTSD which consisted of: psychotherapy, selective serotonin re-uptake inhibitors (SSRIs), mood stabilisers, antipsychotics, antidepressants and benzodiazepines (Shalev 2009). Subjects were examined between February 2010 and June 2010. All participants were adequately informed about the study and after obtaining a written consent an anamnestic and clinical examination was performed by the same person for all subjects. The diagnosis of MPS was based on detailed anamnestic history and careful clinical examination. Important anamnestic information include: duration, intensity, frequency, location and the type of the pain, as well as accentuating or relieving factors. Localization of TPs was based on three manoeuvres: direct finger pressure, flat palpation, pincer palpation. The first two techniques are used for the surface musculature, while the third is used for the deep musculature. In order to reproduce the referred pain it is necessary to wait between 2 and 5 seconds after applying pressure (Vázquez-Delgado et al. 2009).

TPs were localized in the following muscles: m. temporalis, m. temporalis tendon, m. masseter, m. pterygoideus lateralis, m. pterygoideus medialis, m. splenius capitis, m. sternocleidomastoideus, m. trapezius. Participants were classified as having MPS of masticatory muscles if they met criteria according to Research diagnostic criteria for temporomandibular disorders (RDC/TMD) (& LeResche 1992) and in case of the splenius capitis muscle, sternocleidomastoid muscle and trapezius muscle, the diagnosis of MPS was made by presence of TPs.

The study was approved by the Ethics Committee of the School of Dental Medicine, University of Zagreb and by the Ethics Committee of the Psychiatric Hospital Vrapče, Zagreb.

Statistical Analysis

Basic features of the data were described by its frequencies and appropriate percentages. Possible associations were tested by the Chi-Square test. Statistical analyses were performed by the statistical computing environment R version 2.10.1 (Development core team R 2009). Results are presented in three tables and one figure.

RESULTS

The study showed that among 101 subjects with PTSD and depression, 24 (23.7%) had experienced episode of severe depression, 32 (31.7%) experienced episode of moderate depression and 45 (44.6%) experienced episode of mild depression. A total of 59 participants (58.4%) had MPS. Accordingly, among 24 participants with PTSD and severe depression episode 20 participants (83.3%) developed MPS while out of 32 participants with PTSD and moderate depression episode, 23 participants (71.9%) developed MPS and among 45 participants with episode of mild depression, 16 participants (35.6%) developed MPS (Table 1). Regarding association between MPS and severity of depression results showed that higher severity of depression is accompanied by a higher percentage of subjects with MPS (Figure 1). Other problems were also noted such as concentration and sleeping problems 93.1% of participants, 35.6% suffered from rheumatoid arthritis, hypertension 41.6%, hormonal disorders 18.8% and cervical spine problems 80.2%. Because of that 18.8% used heart medications, 27.7% used antihypertensive therapy, 96% used sleeping pills and 71.3% used analgesics. Most frequent site of TPs is the occipital region - 12.9%, and the right temporal muscle - 11.9% (Table 2). We also assessed the impact of intubation as an ethological factor for development of MPS among patients with depression and PTSD. Participants were divided into two groups. The first group (17 subjects) consisted of participants with depression and PTSD who in their medical history had surgical treatment in general anaesthesia and were thus endotracheally intubated. The second group (84 subjects) consisted of participants who were not surgically treated, and were not endotracheally intubated (Table 3). We found no significant association between endotracheal intubation and development of MPS among the war veterans.

DISCUSSION

A large number of soldiers who participated in the Croatian War of Independence (1991-1995) were exposed to traumatic and stressful events and thus developed depression and PTSD. High degree of comorbidity between depression and PTSD is recorded (Arbanas 2010). Around 58.4% of war veterans that participated in this study suffered from MPS (Vidakovic et al. 2014).

Table 1. Frequency of the myofascial pain among subjects with PTSD and depression

	N	%	Severe depression episode and PTSD		Moderate depression episode and PTSD		Mild depression episode and PTSD	
			N	%	N	%	N	%
Myofascial pain	59	58.4	20	83.3	23	71.9	16	35.6
Without myofascial pain	42	41.6	4	16.7	9	28.1	29	64.4
Total	101	100	24	100	32	100	45	100

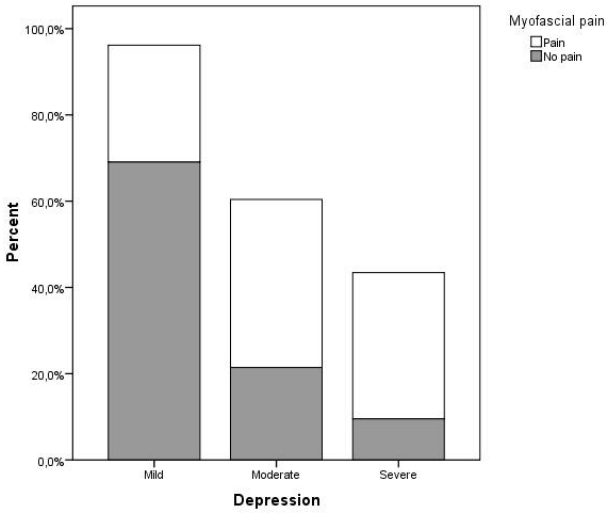

Figure 1. Relationship between myofascial pain and severity of depression (Chi-Square test 18.2; df=2; p<0.001)

Table 2. Localisation of trigger points among patients with myofascial pain (N=59)

Localisation of trigger points	Patients (N)	%
Right masseter muscle	6	5.9
Left masseter muscle	4	4
Right medial pterigoid muscle	3	3
Left medial pterigoid muscle	3	3
Right sternocleidomastoid muscle	2	2
Left sternocleidomastoid muscle	2	2
Sternocleidomastoid muscles bilateral	1	1
Right temporal muscle	12	11.9
Left temporal muscle	8	7.9
Temporal muscles bilateral	1	1
Right trapezius muscle	2	2
Left trapezius muscle	2	2
Occipital	13	12.9

Table 3. Frequency of the distribution of myofascial pain, and the difference between the groups

	Surgery		Without Surgery		Total		Chi-Square	Sig.
Myofascial pain	N	%	N	%	N	%		
Yes	13	76.5	46	54.8	59	58.4	2.743	0.098
No	4	23.5	38	45.2	42	41.6		
Total	17	100.0	84	100.0	101	100.0		

On the other hand, studies concentrated on MPS in the general population showed that levels of MPS are lesser in the general population and account for around 15% (Wheeler 2004). Certain sites in the body are more frequently affected with TPs. Maxillofacial area is such an area (Manolopoulos et al. 2008), and other examinated areas include: splenius capitis muscle, sternocleidomastoid muscle and trapezius muscle, which are also predetermined sites for TPs (Ge 2010). Hsieh reported that manual palpation is the most reliable diagnostic method for detecting TPs (Hsieh et al. 2010). Cummings et al. (2001) indicated that concordance between examiners in the localisation of TPs using manual palpation was around 50%, and in exclusion of TPs concordance was 90%.

Our findings support a positive correlation between depression, emotional stress and muscle pain (Carlson et al. 1998). In addition, other studies confirmed that patients with muscle pain have higher rates of emotional stress and depression (Lindroth et al. 2002). Due to multifactorial mutual effects, depression and PTSD and MPS can lead to a vicious circle. Patients with depression and PTSD and orofacial pain also suffer from sleeping disorders because of changes in hypothalamic-pituitary-adrenal axis (Heim et al. 2000, Pavlisa et al. 2006). Sleeping disorders are linked to muscle pain and muscle tension (Aigner et al. 2003). Activation of peripheral and central afferents participates in pain modulation in the CNS. Central sensitization can also enable supplemental responses from other receptive spots because of convergent somatic and visceral input in the dorsal horn (Sato 1995). Continuous nociception can result with MPS which is characterized by the presence of TPs. Muscle nociceptors activated by painful TPs, following sustained noxious stimulation, initiate changes in pain modulation in CNS. These motor and sensory changes in CNS are connected to the appearance of the referred pain.

It is important to eliminate TPs in treatment of MPS. Pharmacological central inhibition by pain modulators usually prescribed in depression and PTSD are helpful in treating MPS and it can significantly reduce pain (Smith 2001). Pharmacological central inhibition lacks peripheral effect on TPs, and because of that in inactivation of TPs it is important to achieve a peripheral effect on TPs. This is achieved by local massage,

acupressure, ultrasound, transcutaneus electrical nerve stimulation, laser therapy, TP injections, chemical treatment with botulium toxin, and exercise protocols for the muscles.

CONCLUSIONS

We can conclude that the rate of MPS among war veterans with depression and PTSD is high, especially in groups who experienced episode of severe depression and therefore it must be considered in patients with depression and PTSD. Also, we found that depression and stress as etiological factors are more important in the development of MPS in war veterans than potential traumatological factor, in this case endotracheal intubation. The most frequent locations of trigger points were occipital region and the right temporal muscle.

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Conflict of interest: None to declare.

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