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The assesment of trigger points (TrPs) apperiance in masticatory muscles and cervical spine in patients with stomatognathic system (SS) disorders- preliminary reports

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Summary
Introduction: Increased tension around masticatory muscles can cause pain disorders in facial part of the skull, temporomandibular joint, supra- and infrahyoid area and cervical spine. Unphisiological muscle work bring up Trigger Points (TrPs). The consequences is heterotropic pain.

Aim: The objective of the study was the assesment of Trigger Points (TrPs) apperiance in masticatory muscles and cervical spine in patients with myogenic disorders in stomatognathic system.

Material and Methods: 135 female (age 20 – 45 years old) diagnosed with myogenic disorders in stomatognathic system and pain in facial part of the skull were assesed. Physical examination were conducted: medical interview, assesment of Trigger Points (TrPs) apperiance in masticatory muscles and cervical spine.
Results: All patients had pain disorders in facial part of the skull, and reported increased tension in masticatory muscles. 98% had cervical spine pain disorders. All women had increased palpatic

tenderness in masticatory muscles and cervical spine. The number of Trigger Points (TrPs) in supraficial head of masseter muscle was similar to the number of TrPs in sternocleidomastoid muscle of the same side of the body.

Key word: stomatognathic system, cervical spine, trigger points, pain.

Introduction

Biomechanics of the stomatognathic system (SS) tend to hypothesize that increased tension of the cervical spine muscles may contribute to the occurrence of myogenic disorders within the facial part of the skull [1]. Confirmation of this hypothese is Brodie's theory.

In premise is said that: tension the cervical spine and shoulder girdle cause the visual line to rise slightly above the horizontal surface and excessive activation of the antagonistic muscles: infrahyoidei, sternocleidomastoideus. During their contractions, the head is lower [2,3]. It can be stated that there is a balance of muscle forces keeping the head in the required position [4].

The Brodie Theory is confirmed by other scientists research. These include McClean et al., who showed changes in bite contact points during body positioning on the vertical table [5]. Funakoshi et al. have demonstrated different electromyographic activity of chewing muscles during cervical spine movement [6]. It is considered justified to make a cervical spine examination in patients with a disorder of the SS.

The biomechanical association of the stomatognathic system with other anatomical structures within the head, neck and shoulder girdle, indicates the necessity of an interdisciplinary approach to the treatment [7,8,9,10].

Unphisiological muscle work bring up Trigger Points (TrPs). This term was defined by Travell and Simons as "a hypersensitive point localized in the skeletal muscle, painful at the pressure causing heterotopic pain (transferred), tenderness and symptoms of the autonomic nervous system "[11].

The authors found that the presence of active muscle TrPs is a sign of muscle pain and is associated with disorders in the neuromuscular system and the presence of active electrical potentials [12].

Aim

The aim of the study is the assesment of trigger points (TrPs) apperiance in masticatory muscles and cervical spine in patients with stomatognathic system (SS) disorders.

Material and Methods

135 women aged 20-45 years (mean age 33 years) with diagnosed myogenic disorders of the SS and facial pain were studied. The study consisted of two parts. The first part consisted of 6 questions related to current disorders. Second part was a physical examination (palpation of TrPs in the muscles of the masseter muscles, temporalis muscles, pterygoideus lateralis and medialis muscles, suprahyoidei muscles, sternocleidomastoideus, scalene muscles, suboccipital and the upward part of the trapezius muscles). Bumman muscular test technique was used during TrPs searching. The study consisted of pressure the face with the fingertips of the right hand using the force of pressure of about 0.5 kg. In the study of the head muscles, this was the index finger and the third finger of right hand (extraoral examination zewnątrzustne) and the index finger and the thumb of the same hand (intraoral examination). When examining the cervical spine muscles, it was the first and second finger of the right hand. Each patient was examinating first on the right and then left part of the face. During the palpation of the muscle, the patient's head was held to ensure stability for the head and neck complex. The mandible was in a resting position, without any dental contact. Before palpation, the patient was instructed how to distinguish pain from pressure. The obtained data is placed in the patient card. Muscle tests were carried out by the same person in the same conditions each time.

Results

The results of the questionnaire presented in Figure 1, by means of the percentage of responses given to the questions.

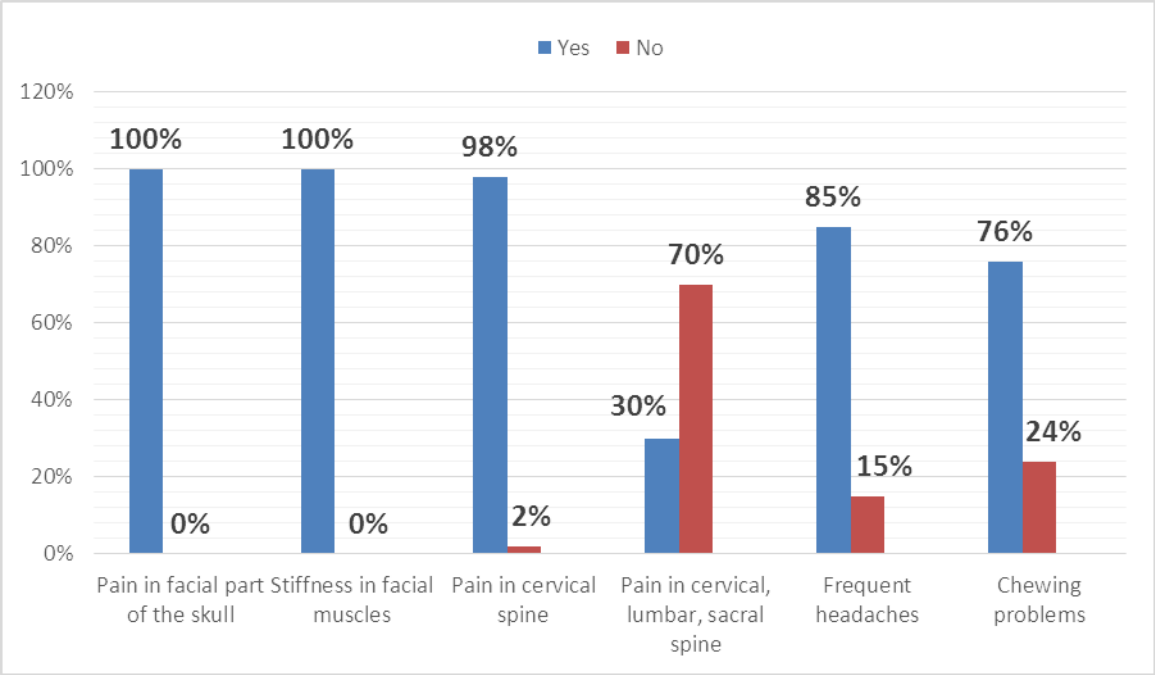

Figure 1. Percentage of responses given to the questions.

As it shown in Fig. 1 all patients with SS disorders reported pain in the facial part of the skull and facial muscle stiffness. 98% of women experienced pain in the cervical spine. Headaches are reported by most women (85%). In 76% of symptoms associated with the SS lead to chewing problems, which definitely affects the quality of life in the study group.

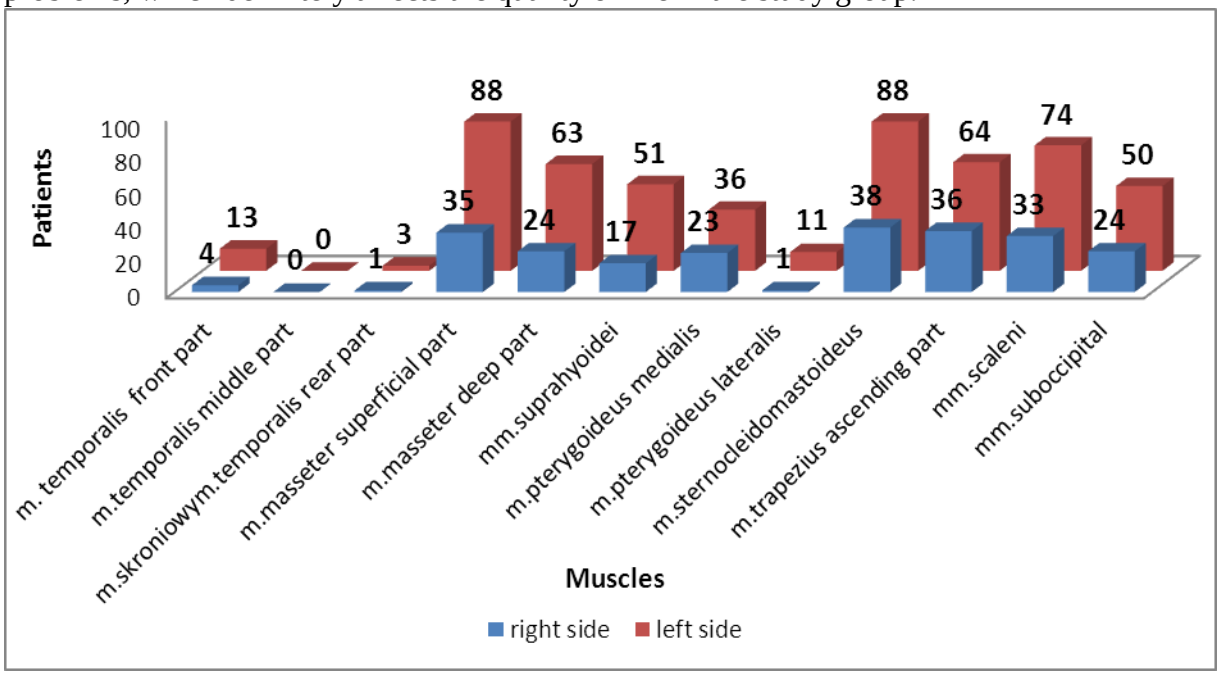

Figure 2. Number of TrPs based on palpation of the right and left side of the head and the cervical spine.

As can be seen from Figure 2, a large number of TrPs in the cervical spine muscles were observed. Within the facial part of the skull, the incidence of TrPs on the left side of the face was greater than on the right. The presence of TrPs on both sides is the result of the biomechanics of the temporomandibular joint, which is a conjugated joint. Anatomical construction and functional

connections in the SS lead to the transfer of overloads and disorders to the opposite side of the face. The number of TrPs in the masseter muscles of the superficial part was similar to the number of TrPs of the sternocleidomastoid on the same side of the face.

Discussion

Transmitting tensions between soft tissues in the human body leads to the occurrence of musculoskeletal system disorders. In the group of women with facial pain, up to 98% reported pain in the cervical spine and shoulder girdle. 30% of them complained of lumbar and spinal pain disorder. The obtained data overlaps with the information contained in Polish and foreign literature. There are numerous reports of the correlation between dysfunctions of the SS and spinal pain, particularly of the cervical spine [14-19].

By performing biomechanical analysis of the SS and of the cervical spine, it can be seen that they form a closed biokinematic chain. This means that all elements can function in a direct way. Increased tension within the SS muscles can cause pain in the facial part of the skull, temporomandibular joints, supra- and infrahyoidei region and cervical spine [20].

One of the symptoms of muscle disorders in the SS is the presence of active TrPs, responsible for the occurrence of heterotypic pain. Regardless of the reasons for the formation of TrPs in the the muscle, excessive fiber spasm. It causes local pressure on the sensory nerves and blood vessels, leading to increased release of acetylcholine, reduced calcium ion uptake and oxygen deficiency. The pathological process that occurs at the cellular level leads to a decrease in energy reserves in the form of adenosine triphosphate (ATP), which results in the release of nociceptive (pain) activation factors.

When evaluating the occurrence of TrPs, pain was reported more frequently on the left side of the cervical muscles. 88 patients reported pain disorders of sternocleidomastoid muscle, 74 musculi scaleni, 64 quadratus femoris (upper part), 51 suprahyoidei muscle, and 50 suboccipital muscles. The above data confirm the relationship between the SS muscles and the cervical spine. In summary: increased muscle tension on one side of the face leads to irradiation of this tension to the cervical spine on the same side. This relationship indicates the need for orthopedic testing in patients with US disorders.

According to Cuccia and Caradona, the lack of treatment for SS conditions carries a serious risk of developing faulty posture [21]. Valentino et al. have demonstrated that the stimulation of pes planus results in increased tone masseter muscles and temporalis muscles [22]. These data support the theory that a change in one joint leads to compensation in other.

Wisinger et al. observed that there is a correlation between disorders in the facial part of the skull and spinal pain and, moreover, it works both ways [23, 24].

Conclussions:

Due to the interdependence between the SS and the cervical spine, increased tension and pain in the SS muscles led to the appearance of TrPs especially in the sternocleidomastoid, scaleni muscles, and quadratus femoris muscles.

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