

## THERAPEUTIC APPROACHES IN TREATING MYOFASCIAL TRIGGER POINTS

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Original scientific paper

### Abstract

Myofascial pain syndrome (MPS) has been described as the most common challenge that general physicians, osteopaths, physical and manual therapists face today. Its's frequency among the patients admitted to chronic pain practices is about 85 % (Han et al. 1997, Skootsky et al. 1989). MPS is characterized by pain originating from the trigger points (TrPs) at muscles and fascia. It is associated with muscle spasm, tenderness, restricted motion. Although the exact pathology of this phenomenon is still an issue of debate, therapists have developed a lot of empirical treatment approaches. The various treatment techniques that are used for treating TrPs are: TrP release (TrPPR - ischemic pressure applied by finger or some similar tool), ultrasound, TENS, LASER, muscle energy technique (MET), positional release therapy (PRT), strain counter strain technique and integrated neuromuscular inhibitory technique (INIT). The aim of this study is to compare the effectiveness of LASER and TrPPR both combined with MET in reducing pain originating from TrPs. Both approaches resulted in decrease in pain levels and increase in pain threshold. Comparison between the groups showed no advantage to one procedure over the other.

**Key words:** trigger points, LASER, MET, myofascial pain, pressure release

### Introduction

Myofascial pain syndrome (MPS) has been described as the most common challenge that general physicians, osteopaths, physical and manual therapists face today. Its's frequency among the patients admitted to chronic pain practices is about 85 % (Han et al. 1997, Skootsky et al. 1989). MPS is characterized by pain originating from the trigger points (TrPs) at muscles and fascia. It is associated with, muscle spasm, tenderness, restricted motion, muscle (Travel et al. 1992, Jaeger et al. 1986). Pain usually radiates to an area away from the TrP. TrPs may either be active or latent depending on the clinical situation. When stimulated TrPs cause referred pain and twitch response. Onset of MPS is associated with long periods of sustained position in which muscles are either stretched or contracted and/or repetitive muscle contraction usually in an altered contraction pattern and/or exposure on cold. Although the exact pathology of this phenomenon is still an issue of debate, therapists have developed a lot of empirical treatment approaches. The various treatment techniques that are used for treating TrPs are: TrP release (TrPPR - ischemic pressure applied by finger or some similar tool), ultrasound, TENS, LASER, muscle energy technique (MET), positional release therapy (PRT), strain counter strain technique and integrated neuromuscular inhibitory technique (INIT) (Chaitow, 2001, Farina et al. 2004). Individually (TrPPR, PRT and MET) has been proved effective for treating myofascial pain syndrome (Ambrogio & Roth, 1998; Chaitow, 2000). LASER along with stretching is an effective treatment for trigger points (Simunovic, 1996). LASER alone as well as in combination with stretching has been proven to be effective in reducing cervical myofascial pain (Beckerman et al, 1992; Hanten et al, 2000; Hakguder et al, 2003).

### Aim

The aim of this study is to compare the effectiveness of LASER and TrPPR both combined with MET in reducing pain originating from TrPs.

### Materials and Methods

The study took place at the Recreational center of University of "Goce Delcev"– Štip from May to September 2015. Thirty – two subject, aged between 23 – 47 years with pain in the shoulder and upper arm due to an active trigger points in the m. infraspinatus were included in this study. Inclusion criteria included a palpable tender spot in the scapula region, reproduction of the subject's pain upon palpation, and a reaction characterized by patient vocalization or withdrawal. The subjects were divided in two groups: Group A (n=17) with an average age of 30.94 ± 6.18 years and Group B (n=15) age 33.66 ± 5.88 years. There was no statistically significant difference between the groups. Demographics of the groups are shown in table 1.

Table 1: Patient demographic characteristics

Group	Age (p=0.85)	Gender	
		M	F
A (n=17) LASER + MET	30.94 ± 6.18	8	9
B (n=15) TrPPR + MET	33.66 ± 5.88	5	10
Total	32.21±6.11	13	19

Group A underwent a treatment consisting of LASER therapy on the trigger points and post isometric relaxation (MET). We used the Medio laser combi by Iskra medical d.o.o. with impulse laser probe with 20 mW maximum output power and 904 nm wavelength. Treatment for the patients in Group A consisted of LASER beam with 1,8J/cm<sup>2</sup>, 3200Hz for 180 seconds per point.

Group B therapy included 6 – 8 ischemic compressions of the TrPs, sustained for 15 – 20 seconds with 10 - 15 seconds pause between compressions, in accordance with Kraydzhikova (2000) and Kraydzhikova (2007). Afterwards we applied post isometric relaxation (MET) on m. infraspinatus on patients from both groups. All subjects underwent three treatments per week for two weeks. For evaluation of the effects of the applied therapy and for comparison between the two groups we used Visual analog scale (VAS) for assessing the pain intensity and pressure algometry for pain threshold. Patients were asked to assess the severity of pain using visual analog scale. For the purpose we used a graphic sliding strip. For the pressure algometry we used a Baseline® algometer consisting of 1 cm<sup>2</sup> diameter plunger mounted on a calibrated hydraulic mechanism. The gauge was calibrated in kilograms/cm<sup>2</sup> and pounds/cm<sup>2</sup>. The gauge held the maximum applied pressure until tared. For measurement, a pressure was applied on a trigger point with the plunger placed perpendicular to the skin surface until pain was felt.

**Results and discussion**

Measurements of with pressure algometry and VAS were taken before therapy course and after the last session. Temperature measurements pre and post treatment of every point.

Table 2. Mean ± SD of the visual analogue scale (VAS), and of the pressure pain threshold

		VAS	Pain threshold (kg/cm <sup>2</sup> )
Before treatment	Group A	6.88±0.99	1.45±0.55
	Group B	6.60±1.06 x	1.30±0.38a
After treatment	Group A	3.00±0.91	2.25±0.57
	Group B	3.46±0.91x	2.24±0.33a

x - Statistically significant between measurements (p <0.05).

Results from the VAS and Pressure algometry testing are showed in Table 2. Both groups showed decrease in VAS scores and increase in pain threshold.

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For both groups, pre and post measurements show statistical significance. In comparison between the groups Group B showed slightly better results but with no statistical significance. Results suggest that both LASER therapy and TrPPR combined with MET can be used as an effective tool in treating MPS and their effects can be described as equal. The improvement in Group A can be attributed to the claimed analgesic effects of the laser beam. Laser provides an analgesic and anti-inflammatory effect by increasing pain threshold in sensory nerve endings, by stimulating the electrolyte exchange in the cell protoplasm and thus increasing the metabolism (Olavi et al 1989). It has been proposed that LASER may improve the oxygen supply by increasing the microcirculation. As explained by several authors hypoxia plays a major role in the development of pain due to trigger point. A study done by Ceylan and coworkers (2004) used infrared laser and found reduction in pain and increased excretion of serotonin degradation products in 24 hour urine excretions. In addition to this, laser irradiation stimulates collagen production, alters DNA synthesis, and improves the function of damaged neurologic tissues (Ceccherelli et al 1989). In Group B the pain reduction may be due to the stimulation of mechanoreceptors which has influence on pain gate during the application of trigger point pressure release and increased circulation, after releasing the pressure which ultimately resulted in pain reduction. TrPPR also helps in reducing tender point in the affected muscle by the mechanism of automatic resetting of the muscle spindles. This is supported by the findings of Albert and Fernandez (2006)

**Conclusion**

Individually both and Laser and TrPPR combined with MET was found to be effective in reducing pain originating from trigger points, however when both groups are compared, there is no difference in the outcome measures. Hence it can be concluded that in short term, both therapeutic approaches are equally effective in managing MPS due to activation of trigger point.

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## TERAPIJSKI PRISTUPI U LIJEČENJU MIOFASCIJALNE TRIGER TOČKE

### Sažetak

*Miofascijalni bolni sindrom (MBS) je opisan kao najčešći izazov s kojim se opći liječnici, osteopati, fizio i manualni terapeuti danas suočavaju. Njegova prevalenca kod pacijenata s kronične boli je oko 85% (Han et al., 1997; Skootsky et al. 1989). MBS karakterizira bol porijeklom iz trigerne točke (TrPs) u mišiće i fascije. Povezuje se s grčem mišića, slabošću, ograničenim kretanjem. Iako je točna patologija tog fenomena još uvijek pitanje rasprave, terapeuti su razvili mnogo empirijskih pristupa liječenju. Različite tehnike liječenja koje se koriste za liječenje TrPs su: TRP otpuštanje (TrPPR - ishemijski pritisak sa prsta ili nekog sličnog alata), ultrazvuk, TENS, LASER, mišićno energetska tehnika (MET), pozicijsko oslobađajuća terapija (POT), strain-counterstrain tehnika i integrirana neuromuskularna inhibitorna tehnika (INIT). Cilj ovog istraživanja je usporediti učinkovitost Lasera i TrPPR, oboje u kombinaciji sa mišićno energetskom tehnikom (MET), u smanjenju boli podrijetlom iz TrPs. Oba pristupa rezultirala su smanjenjem razine boli i povećanjem praga boli. Usporedba između skupina nije pokazala prednost jednog postupka nad drugim.*

**Ključne riječi:** trigger točke, LASER, MET, miofascijalna bol, TRP otpuštanje

Received: July 14, 2015

Accepted: December 05, 2015

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