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THE USE OF TENSEGRITY MASSAGE IN PREGNANT WOMEN: A CASE REPORT

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ABSTRACT

Background: In pregnant women, changes in body posture and higher pelvic anteversion and increase lumbar lordosis are observed. Changes in the arrangement of bony elements result in an alteration in the pelvic floor soft tissue tension, increased resting muscles and ligaments tone in the lumbosacral region and sacral bone. The negative consequences of posture changes in pregnant women is lower back pain. The literature describing a lot of physiotherapeutic procedures and various of type massage which can use in pregnant women. In this study, we present applications of tensegrity massage combined with point manipulation of selected muscle attachments.

Aim of the study: The aim of the study was to determine the effectiveness of tensegrity massage combined with point manipulation of selected muscle attachments in pregnant women.

Material and methods: Two 30-year-old pregnant women received tensegrity massage were qualified for the study. The patients were subjected to a series of nine massage sessions of 45 minutes each, performed three times a week. Pain levels were assessed in both patients using the VAS.

Results: The procedure involved normalization of the tone of the system of ligaments, fascia, and muscles in the lumbar spine region, the pelvic girdle, and the lower limbs. The therapy brought pain relief and reduced muscle tone in the lumbosacral region of the spine, as well as in the pelvic girdle and the lower limbs.

Conclusions: Tensegrity massage combined with point massage is an effective therapy for pain problems and incorrect resting muscle tone caused by pregnancy-related posture changes within the pelvis and spine.

KEYWORDS: tensegrity massage, pain, pregnancy

Background

In pregnant women, changes in body posture and higher pelvic anteversion are observed, as well as increased lumbar lordosis, weight gain, and a shift forward in the center of gravity. Anteversion of the sacral bone in pregnancy directly disturbs the spinal–pelvic balance and reduces the mobility of sacroiliac joints, leading to compensatory changes in other bone structures, such as the hip joints and lower limbs. Changes in the arrangement of bony elements result in an alteration in the pelvic floor soft tissue tension. To maintain the static balance of the posture, the trunk leans backwards [1,2]. Dysfunction of intervertebral joints, together with lumbar hyperlordosis, leads to stiffness in the lumbar region, and excessive tension of the spinal erectors. One result of these pregnancy-related posture changes is a long-lasting aggravation of the ligaments stabilizing the sacral bone (the iliolumbar and sacrotuberous ligaments) and the sacroiliac joints. Moreover, increased lumbar lordosis tightens supraspinous

and interspinous ligaments [2,3]. The increased resting tone is observed in the iliolumbar muscle, and is accompanied by a weakening of the abdominal muscles and the gluteus maximus muscle, which is a typical symptom of lower cross syndrome [4]. Increased muscle tone and overload of tissues leads to the development of active trigger points of the pelvic girdle muscles (gluteus minimus muscle, iliolumbar muscle, longissimus dorsi muscle) [5]. Also characteristic is abnormal activity and the activation of selected pelvic girdle muscles during walking and, consequently, overload and increased tone of the muscular–fascial structures [2]. These symptoms—active trigger points, increased resting muscle tone, and tissue overload—give rise to lumbar spine pain, radiating to the pelvic girdle area and lower limbs. Such pain experienced by pregnant women is usually caused by the disturbed resting tone of the muscles—namely of the gluteus maximus and medius, piriformis, quadratus lumborum and lumbocostal muscles, as well as the posterior thigh muscles and soleus muscle [5,6]. The tendency of the sacral bone to adopt a horizontal position increases the tension on the spinal erector, increases the disturbed activity of the iliac and lumbar muscles, and causes irritation and stretching of the piriformis muscle. The consequence of these changes is improper gait in which the pelvis does not swing; this establishes negative patterns and leads to overloading of the joints. Modifications in the arrangement of the bony elements impose compensatory changes on the system of muscles, ligaments, and tendons, which may produce so-called piriformis syndrome [2,6,7]. A permanent abnormal resting tone of the piriformis muscle can bring about pressure on the upper and lower gluteal arteries, as well as on the branches of the ischiadic nerve, leading to disturbances in the blood supply to the gluteal area and to persistent pain and paresthesia in the areas of the lumbar spine, buttocks, thigh, kneepit, shin, and even foot [8]. In pregnant women, weakness in the gluteus medius is sometimes observed, potentially producing pain in the lower back [2]. Alterations in the function of the pelvic girdle, sacral, and pelvic ligaments can result from prolonged dysfunction and muscular imbalance. Persistently irritated iliolumbar and sacrotuberous ligaments, as well as sacroiliac joints, prevents stabilization of the pelvis. Dysfunction is also observed in the interspinous and supraspinous ligaments, as a reaction to increased lumbar lordosis [2,6,9]. Inappropriate tension in those causes lumbar, sacral, inguinal, and gluteal pain, which can radiate to the thigh and shin, and even to the foot area. The negative consequences of posture changes in pregnant women include pain complaints of varying severity and location [2,6].

Treatment methods for such pain during pregnancy include pharmacotherapy with paracetamol, which has analgesic and febrifugal effects [6,10]. We can also use physiotherapeutic procedures, such as transcutaneous electrical nerve stimulation (TENS), hydrotherapy, and kinesiotherapy (full-body prenatal exercises, functional and relaxation exercises, and water exercises) [10–13]. Additionally, to alleviate lower back pain (LBP) in pregnant women, autogenic respiratory training, postisometric muscle relaxation (PIR), fascia release techniques, segmental stabilization exercises, manual therapy techniques, craniosacral therapy (CST), and aromatherapy can all be used [6,9,14–20]. Various types of massage are useful, including relaxation, classic and therapeutic massage, lymphatic drainage, acupuncture and yoga [6,9,11,17,21–24]. There are numerous indications for massage in pregnant women, such as swelling or pain in the lower limbs and coexisting pain in areas of the body other than the lumbar region (for example, shoulder and neck pain). The most common of these is lumbar–sacral pain. The question in such cases is whether this spine region should be manipulated locally, or whether touch stimulation of the back abdominal wall should be avoided in favor of stimulating the lower part of the pelvis by manipulating the lumbosacral region spinal segment and sacral bone. The methodology should be tailored to the woman's current needs and abilities, and should be modified during the therapy, depending on changing symptoms. Additionally, the massage methodology should be considered by the patient's doctor [11]. There are also contraindications for massage in pregnant women that must be observed. These include an abnormal course of pregnancy associated with disturbed fetal development and dysfunction of the urogenital system; nephropathies: nephrocystitis, nephrolithiasis, renal failure; thyroid diseases: hyperthyroidism and hypothyroidism, as well as endocrine hyperfunction and hypofunction; pancreatopathies (pancreatitis, gestational diabetes mellitus); diabetic nephropathy; cardiovascular diseases and ninth month of pregnancy [11–13].

Objectives

In this study, we present applications of tensegrity massage combined with point manipulation of selected muscle attachments. Point manipulation has direct effects on the tendon part of muscle attachments and does not overload tissues. The advantage of tensegrity massage over other types of massage is that tissues located in distal parts and which are in indirect contact with the most painful locations are manipulated first; this allows for gradual normalization of tissue tone and allows the possibility of manipulating the most painful area in the final stage of the procedure. In this study, we present the cases of two patients who share many similarities, being of the same age (30 years old), pregnant for the first time, and with the same job (professional musicians). The differences lie mainly in their body builds and the pathomechanism of pain, as well as their mental and emotional states. Despite the differences we made an attempt to use tensegrity massage combined with point manipulation of selected tissues and we managed to alleviate pain in both women. Both women had increased resting tone, though in different tissues, which directed the choice of two separate massage methodologies.

Material and Methods

Participants

The first woman was 164cm/5.4ft tall and with a body mass of 50kg/110.2lbs, very slim, petite build, with a small pregnancy belly. She was in the second month of pregnancy, professionally active, working as a violin teacher in a music school, playing the violin professionally. She was on a healthy diet but not involved in any regular physical activity, other than occasional skiing in the season. She felt very well, was generally content, and was committed and eager to doing everything necessary to delivering a healthy baby. The violinist sought massage therapy for a strong, nagging, radiating, pain that had persisted for three weeks in the lumbar spine region, the gluteal area, and in the left lower limb. This was most probably caused by a fall from a ladder that had occurred while cleaning windows: a sudden jump from the second rung of the ladder, landing on the left lower extremity, might have been the cause of the pain, which tended to increase after work and after a long time sitting. It extended downwards along the back part of the thigh towards the knee, following the ischiadic nerve. As indicated by the patient, the pain was most intense in the gluteal area. A pain avoidance gait helped lighten the load on the affected (left) lower extremity: this involved bending slightly at the knee and iliac joints, with the buttocks moved backward. The woman complained of a pulling sensation on the back part of the thigh and a squeezing sensation in the buttock. She avoided lying on her back, because the pain was increased in this position. Today, she has visible adhesion and stretch marks in the gluteal and iliac areas. The patient had not yet made use of pharmacotherapy or physiotherapy.

The second woman was 185cm/6.1ft tall, had a body mass of 78kg/172lbs, and had a pregnancy belly proportional to the other parts of her body. She was in the third month of pregnancy and active as a professional harpist and harp teacher in the music conservatory. She regularly cycled, went to the swimming pool, and frequently visited health and beauty spas. However, the nature of her job (frequent trips, concerts) made it impossible to have regular meals and to obtain sufficient amount of good-quality sleep. The harpist suffered from an acute stabbing pain in the lumbar spine region and the pelvic girdle area. She also complained of a burning, excruciating, enduring pain between the shoulder blades, accompanied by the sensation of swollen and heavy lower limbs. She additionally felt tension in the area of the neck, shoulder girdle, and upper limbs. Visual assessment revealed protraction of the shoulders, rounded back in the thoracic spine region, a pulling sensation from the greater pectoral muscle, lumbering gait, and inability to relax the trunk. The patient felt generally unwell, and complained of fatigue and lack of sleep.

Intervention

Therapeutic process

The patients were referred to a physiomassage therapist by the primary care physician after having consulted the gynecologist-obstetrician in charge of the pregnancy. Since both pregnancies had a normal physiological course and there were no medical contraindications, this type of massage could be applied. Prior to each session, we performed a palpation evaluation of the structures belonging to particular systems, according to a chart of the patient's condition for massage purposes. On the basis of the results, which indicated abnormal resting tone of the muscular–fascial structures, we selected the massage methodology, each time taking into account the individual current state of the patient (Table 1).

The palpation evaluation was supplemented with a visual assessment of body posture and with information from the interview concerning the movements performed when playing the instrument, the pain location, and the type of joint mobility disorders. Prior to the therapy, as well as immediately and two months after its completion, we used the Visual Analogue Scale (VAS) to assess the severity of pain. Next, we performed the final palpation assessment of tissues to be manipulated during the procedure, in order to demonstrate the effects of the massage. The patients were subjected to nine tensegrity massage sessions (45 minutes each) at three-day intervals. The entire course of therapy lasted 21 days (Figure 1).

Before, immediately after, and two months after the end of the therapy, the patients were screened for psychological distress using a 28-item version of the General Health Questionnaire (GHQ-28) [25,26], in its Polish version by Makowska and Merecz (2001), (59% sensitivity, 75% specificity) [27]. The GHQ-28 allows the general health status to be assessed. It consists of 28 items divided into four seven-item scales measuring four health dimensions—namely, somatic symptoms, anxiety and insomnia, social dysfunction, and severe depression. Each item is accompanied by four possible responses scored from 0 to 3 with a total possible score ranging from 0 to 84, which is considered to be more sensitive in the measurement of psychological distress. A total score of 23/24 is the threshold for the presence of distress. Higher scores indicate a greater probability of mental trouble [28]. The patients' answers on the GHQ-28 were analyzed by a psychologist.

Massage methodology

Nine massage sessions of 45 minutes each were performed three times a week. Each session consisted of initial, main, and final stages. The first stages was to correctly position the patient lying on the side, to ensure safety, comfort, and support of the upper and lower limb joints and tissues, as well as the smooth flow of venous blood and lymph [29,30] (Figure 2).

Table 1. Patient status card for tensegrity massage

Symptoms (what hurts?)													
Sym-metrical													
Asym-metrical													
Disease course: When was the problem first experienced? How has it developed? When did it intensify? What is it associated with?													
Left side						PERFORM PALPATION ASSESSMENT (COMPRESSION SENSITIVITY) AT THE FOLLOWING LOCATIONS	Right side					
Date of examination							Date of examination						
V					H		V						H
LATISSIMUS DORSI MUSCLE SYSTEM													
x					x	External lip of iliac crest of ilium	x						x
x					x	Lateral surface of spinous processes T5, T6, T7	x						x
x					x	Lateral surface of calcaneus							x
					x	Pisiform bone							x
GREATER PECTORAL MUSCLE SYSTEM													
					x	Crest of greater tubercle of humerus							x
x						Medial surface of anterior superior iliac spine							
x						Tuberosity of first metatarsal bone							
SERRATUS ANTERIOR MUSCLE SYSTEM													
x					x	Upper angle of shoulder blade	x						x
x					x	Coracoid process of scapula							x
x					x	Upper surface of greater trochanter of femur	x						x
x					x	Greater tubercle of the humerus							x
x					x	Lateral condyle of the humerus							x
SACROTUBEROUS LIGAMENT SYSTEM													
x					x	Posterior superior iliac spine	x						x
x					x	Lateral surface of sacral bone	x						x
x					x	Linea aspera of femur (halfway along femur)							x
x					x	Inferior nuchal lines of occipital bone							x

In this stage, we applied superficial stroking and deep stroking. Manipulation lasted about five minutes. In the main stage, we manipulated four systems of tissues selected for tensegrity massage. The first was the latissimus dorsi muscle system. This includes both tissues, such as the superficial layer of the gluteus maximus, which are in direct contact with this muscle, and tissues in distal parts (such as the superior peroneal retinaculum) that are in indirect contact with the muscle. Second was the greater pectoral muscle system, which includes both connective tissues, such as the abdominal superficial fascia, located closest to the muscle, and tissues in distal parts, such as the peroneal muscles. The third system was that associated with the anterior serratus muscle. This includes several subsystems of structures—for example, the levator scapulae muscle and the coracobrachialis muscle— which have a common initial or a final attachment to the anterior serratus. The fourth system concerns the sacrotuberous ligament and includes the tissues located directly in the area of that ligament (for example, the deep

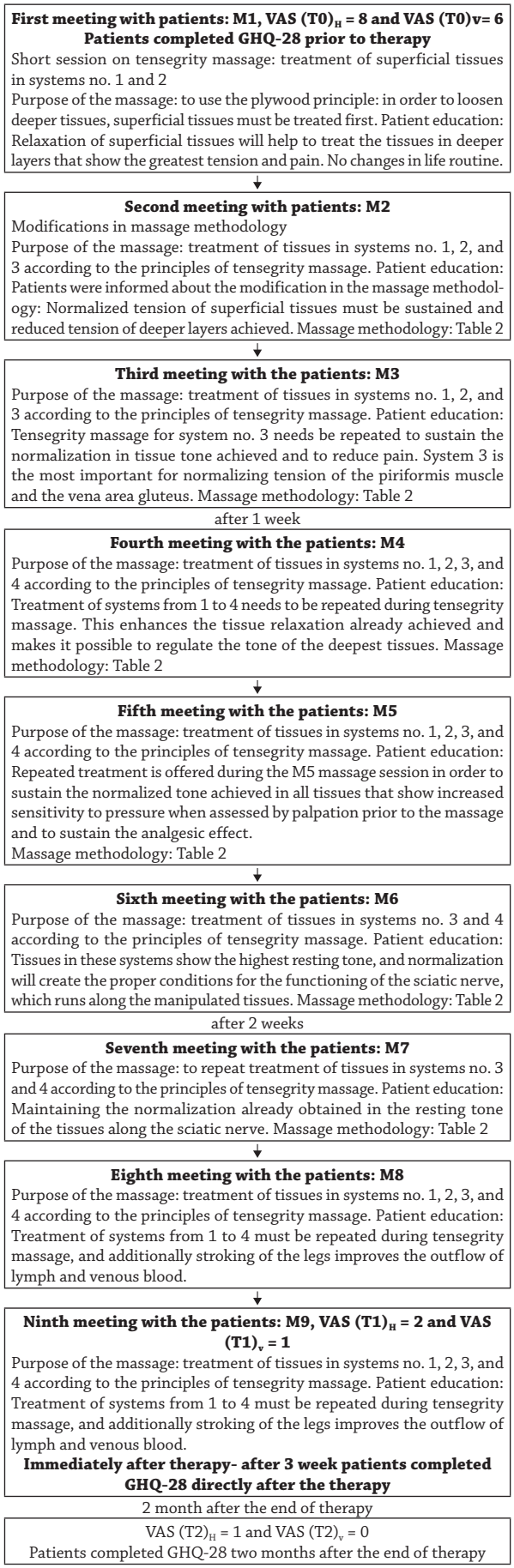

Figure 1. Diagram of applied treatment schedule

(T = point in time, M = massage, T0 = before massage, T1 = after M9, T2 = 2 month after M9).

Figure 2. Patient's positioning

layer of the gluteus maximus muscle) as well as tissues indirectly connected to it, such as the posterior shin muscles [30]. At this stage, the methodology of the procedure (the sequence and number of tissues to manipulate) was different for each patient, due to the differing results from palpation assessment (Table 2). Manipulation of the selected tissues in the correct order allows muscle tone to be regulated more accurately and effectively. It also helps to avoid direct manipulation of tissues located in the most painful area. Additionally, we performed point manipulation of selected tissues in the lumbar–sacral region. This means that tissues were manipulated only at the muscle attachments and not along the muscle course, which is an advantage for pregnant women, since it strengthens their conviction that massage is safe for their babies. Point manipulation involves pressing the tendinous part of the muscle and local rubbing. The pressure should not be very strong, but may evoke slight pain, which abates as the manipulation proceeds. In the final stage of the procedure, stroking of the manipulated area of the body was performed. The massage therapist manipulated both the left and right side of the body, starting from the more painful side [29–31].

During the therapy and immediately after its end, the massage therapist told the patients about the localization and number of manipulated tissues, demonstrating the inappropriate resting tone. She explained the

Table 2. Methodology of tensegrity massage (connective tissue and techniques)

Violinist		**Harpist**	
Connective tissue	**Techniques**	**Connective tissue**	**Techniques**
System 1		**System 1**	
Superior fibular retinaculum	Deep stroking, spiral friction	Superior fibular retinaculum	Deep stroking, spiral friction
Posterior crural intermuscular septum	Deep stroking, spiral friction	Posterior crural intermuscular septum	Deep stroking, spiral friction
Iliotibial tract, posterior part	Deep stroking, spiral friction	Iliotibial tract, posterior part	Deep stroking, spiral friction
Gluteus maximus superficial layer	Transversal kneading	Gluteus maximus superficial layer	Transversal kneading
Medial intermuscular septum of arm	Deep stroking, spiral friction	Hypothenar eminence, thenar eminence, and palmar aponeurosis	Stroking, friction, transversal kneading
Latissimus dorsi muscle	Stroking, rolling, friction, transversal kneading in upper part of the muscle	Anterior muscle group of the forearm	Stroking, friction, transversal kneading
		Medial intermuscular septum of arm	Deep stroking, spiral friction
		Latissimus dorsi muscle	Stroking, rolling, friction, transversal kneading

Table 2. cont.

Violinist		Harpist	
Connective tissue	**Techniques**	**Connective tissue**	**Techniques**
System 2		**System 2**	
Anterior intermuscular septum of leg	Deep stroking, spiral friction	Trapezius, ascending part	Transversal kneading
Lateral muscle group: peroneus longus and peroneus brevis	Stroking, friction, transversal kneading	Deltoid, spinal part	Stroking, rolling, friction, transversal kneading
Iliotibial tract, anterior part	Deep stroking, spiral friction	Trapezius, transverse part	Stroking, rolling, friction, transversal kneading
Sartorius muscle	Stroking, friction, transversal kneading	Deltoid, clavicular part	Stroking, rolling, friction, transversal kneading
Tensor fasciae latae	Transversal kneading	Trapezius, descending part	Transversal kneading
Ligament inguinal	Friction in a single point of insertion	Pectoral fascia	Skin mobilization
		Pectoralis major	Transversal kneading
System 3		**System 3**	
Biceps brachii Coracobrachialis Pectoralis minor	Stroking, rolling, friction, transversal kneading Skin mobilization	Biceps brachii Coracobrachialis Pectoralis minor	Stroking, rolling, friction, transversal kneading Skin mobilization
Serratus anterior Rhomboid minor Supraspinatus Levator scapulae	Skin mobilization Kneading	Serratus anterior Rhomboideus minor Supraspinatus Levator scapulae	Skin mobilization Kneading
Lateral and posterior muscle groups of the forearm Lateral intermuscular septum of arm Medial deltoid Supraspinatus	Stroking, rolling, friction, transversal kneading Spiral friction Stroking, rolling, friction, transversal kneading Kneading	Lateral and posterior muscle groups of the forearm Lateral intermuscular septum of arm Medial deltoid Supraspinatus	Stroking, rolling, friction, transversal kneading Spiral friction Stroking, rolling, friction, transversal kneading Kneading
Serratus anterior Rhomboid major Infraspinatus Teres minor Supraspinatus	Skin mobilization Friction Kneading	Serratus anterior Rhomboid major Infraspinatus Teres minor Supraspinatus	Skin mobilization Friction Kneading
Gluteus medius Iliacus Quadratus lumborum **Piriformis** superior and inferior glutea	Transversal kneading Pressure and friction in a single point of insertion, locally on insertion Pressure and friction at a single point of insertion, half way along the upper and lower edge of piriformis muscle	Gluteus medius Iliacus Quadratus lumborum **Piriformis** superior and inferior glutea	Transversal kneading Pressure and friction in a single point of insertion, locally on insertion Pressure and friction at a single point of insertion, half way along the upper and lower edge piriformis muscle
System 4		**System 4**	
Deep layer of the gluteus maximus	Transversal kneading	Deep layer of the gluteus maximus	Transversal kneading
Posterior muscle group of the femoris (hamstring group)	Stroking, rolling, friction, transversal kneading	Posterior muscle group of the femoris (hamstring group)	Stroking, rolling, friction, transversal kneading
Adductor major muscles	Longitudinal kneading	Adductor major muscles	Longitudinal kneading
Popliteus	Skin mobilization	Popliteus	Skin mobilization
Surae posterior muscles	Stroking, rolling, friction, transversal kneading	Surae posterior muscles	Stroking, rolling, friction, transversal kneading
Erector spinae muscles	Friction in a single point of insertion, locally on insertion	Erector spinae muscles	Friction in a single point of insertion, locally on insertion
Sacrotuberculus ligament	Friction in a single point of insertion, locally on insertion	Sacrotuberculus ligament	Friction in a single point of insertion, locally on insertion

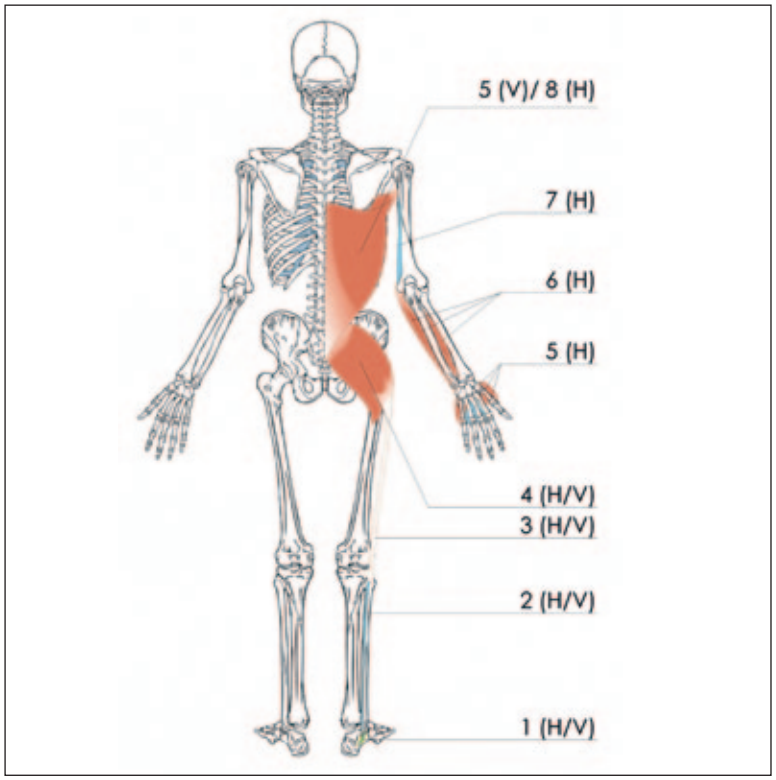

Figure 3. System I

Harpist: 1. Superior fibular retinaculum. 2. Posterior crural intermuscular septum. 3. Iliotibial tract, posterior part. 4. Gluteus maximus superficial layer. 5. Hypothenar eminence, thenar eminence, and palmar aponeurosis. 6. Anterior muscle group of the forearm. 7. Medial intermuscular septum of arm. 8. Latissimus dorsi muscle. Violinist: 1. Superior fibular retinaculum. 2. Posterior crural intermuscular septum. 3. Iliotibial tract, posterior part. 4. Gluteus maximus superficial layer. 5. Latissimus dorsi muscle.

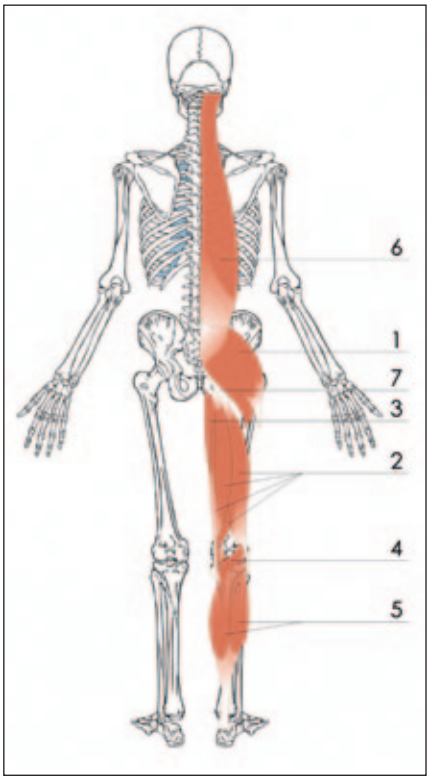

Figure 4. System IV

1. Deep layer of the gluteus maximus. 2. Posterior muscle group of the femoris (hamstring group). 3. Adductor major muscles. 4. Popliteus. 5. Surae posterior muscles. 6. Erector spinae muscles. 7. Sacrotuberculus ligament.

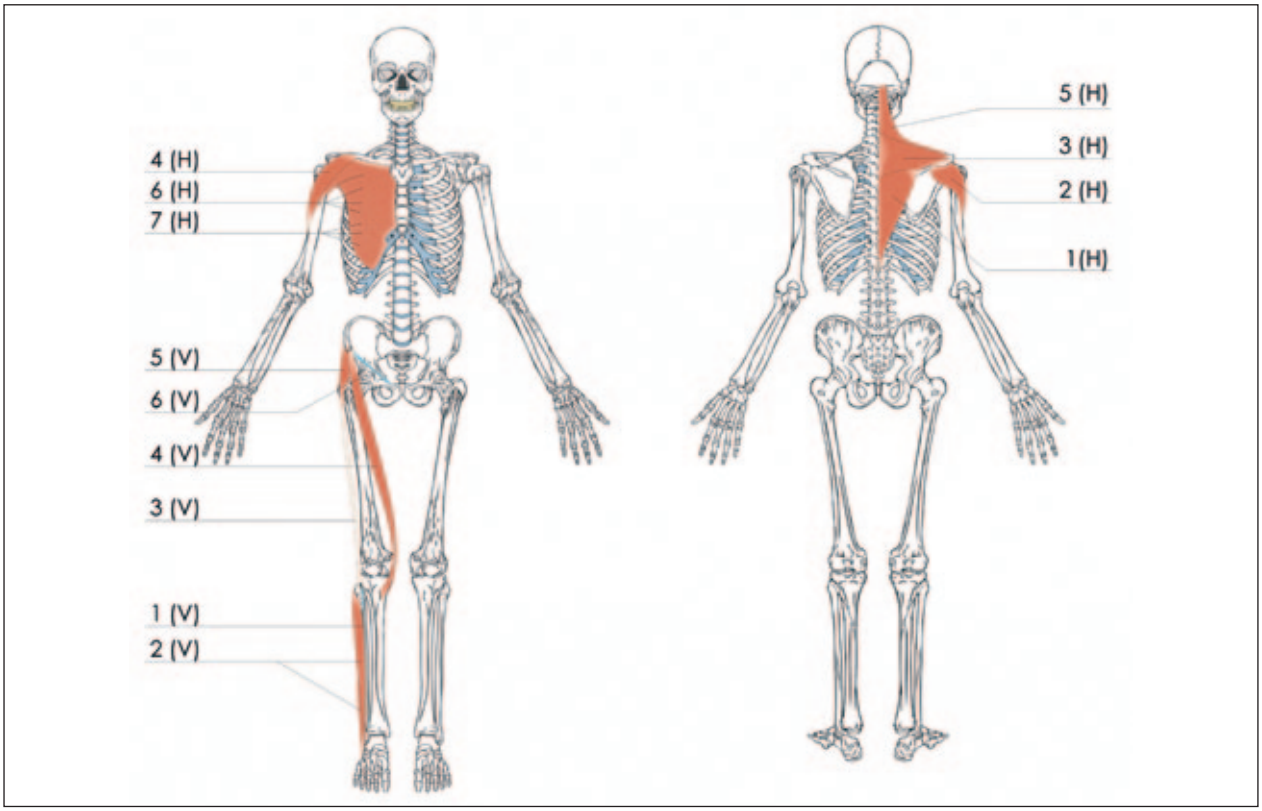

Figure 5. System II

Harpist only top: 1. Trapezius, ascending part. 2. Deltoid, spinal part. 3. Trapezius, transverse part. 4. Deltoid, clavicular part. 5. Trapezius, descending part. 6. Pectoral fascia. 7. Pectoralis major. Violinist only down: 1. Anterior intermuscular septum of leg. 2. Lateral muscle group: peroneus longus and brevis. 3. Iliotibial tract, anterior part. 4. Sartorius muscle. 5. Tensor fasciae latae. 6. Ligament inguinal.

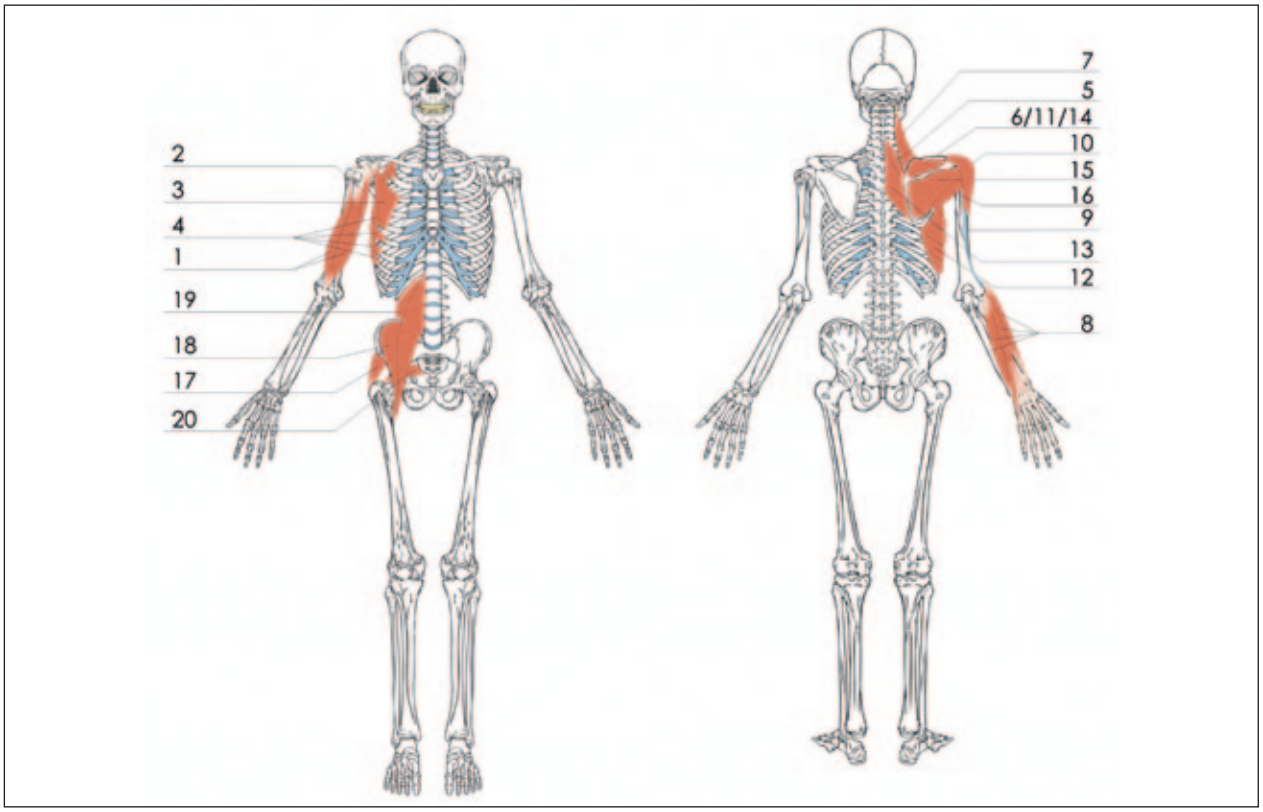

Figure 6. System III.

1. Biceps brachii. 2. Coracobrachialis. 3. Pectoralis minor. 4. Serratus anterior. 5. Rhomboideus minor. 6. Supraspinatus. 7. Levator scapulae. 8. Lateral and posterior muscle groups of the forearm. 9. Lateral intermuscular septum of arm. 10. Medial deltoid. 11. Supraspinatus. 12. Serratus anterior. 13. Rhomboid major. 14. Supraspinatus. 15. Infraspinatus. 16. Teres minor. 17. Gluteus medius. 18. Iliacus. 19. Quadratus lumborum. 20. Piriformis.

need for gradual and selective manipulation of the tissues, informed the patients about the need for correct positioning to support the lower limbs and spine, and explained how to get out of bed correctly and how to safely perform other everyday activities, such as bending down and lifting things.

Results

Case 1

The results for the first patient (the violinist) are as follows: prior to the therapy, her VAS score was 6 (T_0); immediately after the therapy, the VAS score was 1 (T_1); and two months after the therapy, the pain had subsided and the VAS score was 0 (T_2). In the middle of the therapy, the pain reduced, as was confirmed by the lower number of tissues showing increased tone. This enabled the patient to make attempts to maintain the correct posture and to walk with an appropriate even load on the lower limbs. Bending and extending the lumbar region no longer caused pain, and bending was not accompanied by the pulling sensation along the whole back part of the lower limb. Neither did pain radiate to the knee pit. The patient was educated on the following aspects: resting in the back-lying position but with properly arranged and raised lower limbs, getting out of bed from the side and with bent lower limbs, relaxing the buttocks, making attempts to correctly load the left lower limb in the standing position and during walking, and maintaining the correct extensor posture. Analysis of this patient's responses to the questionnaire showed that her mental state before the therapy was good: her total score (x = 26) was lower than the average scores obtained in the female population (x = 27.35). Analysis of specific factors indicated that the patient was not depressed; she scored highly on the Somatic symptoms and Social functioning disorders scales. Her state noticeably improved immediately after the therapy (x = 12). All subscale scores were below the cutoffs. The greatest improvement was achieved in Social functioning disorders and Somatic symptoms. An examination performed two month after the therapy demonstrated that all symptoms have minimized. A very low total score (x = 2) indicated good mental health status. Immediately after therapy, two months after the end of therapeutic sessions, and at the end of pregnancy, the violinist was not suffering from the pain syndrome.

Case 2

The results for the second patient (harpist) are as follows: prior to treatment, her VAS score was 8 (T_0). Immediately after the therapy, her VAS score was 2 (T_1). Two months following the end of the therapy, the VAS score was 1 (T_2). The therapy included selected techniques for lower limb lymphatic drainage since, after an active day, the patient noted slight swelling in the area of the tarsal joints and feet. The education

of the patient involved demonstrating the supportive back-lying position and putting wedges under the body when lying on the side lying, as well as explaining the important points of the correct lying position. Analysis of the GHQ responses showed that the total score (x = 30) obtained by the second patient (harpist) prior to therapy exceeded the threshold and was significantly higher than the average score obtained by healthy individuals (x = 27.35). Analysis of the subscales revealed that the patient did not suffer from depression, and that the total score resulted from the high scores on Anxiety, Somatic symptoms, and Social dysfunction. The patient's state improved considerably immediately after the therapy (x = 8). All subscale scores were below the thresholds. The greatest improvement was observed for Somatic symptoms and Anxiety, confirming the effectiveness of the massage. The examination conducted two month after the end of the therapy demonstrated that all symptoms were minimized. The total score (x = 1) was very low, indicating good mental health. Immediately after therapy and two month after the end of therapy, the harpist was no longer suffering from the pain syndrome in the lumbar region. In the ninth month of pregnancy, she felt a pain in the neck and shoulder girdle. We applied classical massage and manipulated the soft tissue neck: (muslces: trapezius: descending, transverse, ascending; deltoid; rhomboid: minor and major, supraspinatus and infraspinatus; levator scapulae). We educated the patient about the need to rest in the correct position—lying back with lower limb high.

Discussion

Considering the significant limitations found in pregnant women suffering from pain syndrome, finding pain treatment methods that are both effective and safe for both the future mother and her baby is a priority for physicians and physiotherapists. Posture changes in pregnancy are inevitable, and the risk of pain problems is high. The most desired solutions are those that are the most effective and the least invasive. The education of the future mothers to maintain the therapeutic effects and to prevent pain problems is also of equal importance.

In pregnant women, we can use various types of physiotherapeutic procedures and kinesiotherapeutic methods, as well as many types of massage (relaxation, aromatherapeutic, classic, therapeutic, lymphatic drainage), massage during pregnancy and labor, massage after delivery can also be mentioned here [6,9,17,23,32,33]. The main objectives of massage are to alleviate pain, to reduce stress and fatigue, to relax and regenerate, and to maintain wellbeing [17,21,33]. However, in advanced and difficult cases of bothersome and persistent pain—such as sciatica and piriformis syndrome—we should apply therapeutic massage based on carefully adapted and well-described methodologies [7].

As we can see from the example of the patients described in this article, the massage methodology should always be tailored to the patient on the basis of her main symptoms, current physical and mental state, and the changes that occur during therapy with respect to coexisting symptoms. Our study demonstrates the possibility of using the same type of massage, despite the different pain pathomechanisms. This case reports it shows that very important for physical therapists it is accurately performed diagnosis tissue tension before massage [31]. Nevertheless, it is necessary to monitor the positive effects obtained at each stage in order to modify, if necessary, the planned manipulations so as to react appropriately to changes occurring in the tissues and to predict the direction of further changes. Tensegrity and point massage require knowledge of anatomy, manual experience, interpersonal skills, and the ability to gain the patient's trust and give her a feeling of safety. The examples presented in our study encourage future research concerning the use of this type of massage in most pregnant women. As we can see from the example of the patients described in this article, the massage methodology should always be tailored to the patient on the basis of her main symptoms, current physical and mental state, and the changes that occur during therapy with respect to coexisting symptoms.

In our further research, we would like to apply the type of massage described here to a greater number of patients. Moreover, we plan to use a quality of life questionnaire to demonstrate the influence of pain syndrome on the functioning of pregnant women in everyday life, as such pain—together with the hormonal changes occurring in pregnant women—substantially reduces their quality of life, leads to sleep problems, fatigue, and feeling of discomfort, and can cause pregnant women to cease certain everyday activities and to limit their social life [8,20–22].

Conclusions

Tensegrity massage can serve as an element of therapies to relieve pain in pregnant women. It is an effective form of the counteracting pain caused by posture changes, and by increased or abnormal resting tone of the system of ligaments, fascia, and muscles.

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