

## Deep Tissue Massage and its Effect on Low Back Pain and Functional Capacity of Pregnant Women - A Case Study

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### Abstract

**Introduction:** The incidence of low-back pain during pregnancy is very common. Deep tissue massage is an effective therapy relieving subacute and chronic low back pain.

**Purpose:** To evaluate if a deep tissue massage is beneficial for low back pain and functional capacity of pregnant women.

**Methods:** A woman, aged 28, with low back pain went under deep tissue massage treatment which consisted of specific techniques: appropriate pressure, combination of lengthening movements, movements in intermuscular grooves, anchor and stretch technique, releasing muscle adhesions. There were twelve 30-minute sessions in total. The following questionnaires were used for the assessment of patient: Modified Roland-Morris Disability Questionnaire (RDQ), Modified Oswestry Low Back Pain Disability Index (ODI), Quebec Back Pain Disability Scale (QBPD), and The Numeric Rating Scale (NRS).

**Results:** In all parameters there was improvement: (RDQ), (ODI), (QBPD), and (NRS).

**Conclusion:** A positive effect of deep tissue massage on low back pain and functional capacity in pregnant women was noticed.

**Keywords:** Pregnancy; Deep tissue massage; Low back pain

### Introduction

Low back pain occurs often in pregnant women [1]. The incidence of low-back pain during pregnancy is thought to be about 50% [2]. 19% of women who experience low back pain in pregnancy refrain from another pregnancy [3]. Approximately 80% of pregnant women with low back pain experience problems in everyday activities, housework, and their jobs [4]. A decreased quality of life of pregnant women is a serious problem which should not be underestimated [5].

In pregnancy low back pain can be due to a combination of mechanical, hormonal, circulatory, and psychosocial factors. Treatment modalities are often poor, as the cause of back pain is not always fully understood [6]. Therefore, sometimes a treatment is limited to the assurance of the physician in charge that this is normal symptom [7] and frequently dismissed as trivial and inevitable [8].

Low back pain may occur at any time in the pregnancy. The pain is usually blunt, increases during activity and is relieved after rest; it may also interfere with sleep. It is often a cause for a sick leave [9].

Lumbar back pain in pregnant women may radiate to one leg. This character of pain does not differ from the pain in the same area in women who are not pregnant. The pain may also radiate to the thigh or knee [10], occur on one or both sides, increase during long static loads on the musculoskeletal system and involvement of the lumbar

spine, cause an asymmetric pelvic position and thus hinder climbing the stairs, long walking and changing position during sleep [11].

Massage therapy may be beneficial for stress, wellness, and pain reduction among women during pregnancy [12-14]. Massage therapy is often used to treat low back pain during pregnancy [12,15-18]

There is small number of available studies related to the effect of massage on pain perception and functional capacity of pregnant women. This study is the first one to use deep tissue massage (DTM) on low back pain and functional capacity of pregnant women.

### Material and Methods

#### Patient profile

A woman, aged 28, whose beginning of pregnancy was established at 17 April 2015 experienced low back pain from around week 25 of pregnancy. The pain intensified during everyday activities, in particular during applying a long-term, static load on the spine. Lumbar pain was not experienced in a Lasegue test – a negative result. The patient had normal range of motion in both lower limbs in each movement in hip, knee and ankle joints. The pain was local and did not radiate to lower limbs. Patient showed the pain to be concentrated in the lumbar region above the sacrum and it was experienced when the patient was in forward flexion. Palpation of the lumbar spine showed increased tone of the spine extensor and exacerbates pain. Its

tenderness to pressure was greater on the right side. Neurological reflexes and cutaneous sensibility were normal, no muscular atrophy.

Patient did not have warning signs such as history of trauma, unexplained weight loss, history of cancer, steroid use, drug abuse, human immunodeficiency virus infection or immunosuppressed state, neurological symptoms/signs, fever, or systemically unwell. Specific contraindications for massage in pregnant women are shown in Table 1.

The first two months of pregnancy,
9th month of pregnancy,
Diabetes,
Cardiovascular diseases, anaemia,
Vascular haemorrhagic diathesis and platelet related haemorrhagic diathesis,
Haemorrhagic diathesis caused with plasmatic etiology,
Pancreatitis,
Glomerulonephritis and pyelonephritis, acute renal failure, renal colic (including 4 weeks after), congenital kidney defects,
Gestosis (occurs in the 1st trimester),
Preeclampsia and eclampsia,
Hyperthyroidism and hypothyroidism,
Hyperparathyroidism and hypoparathyroidism,
Urogenital dysfunction,
Anomalies in foetal development,
Previous abortions,
Previous miscarriage,
Previous early birth,
Dilated cervix,
Bleeding or spotting in the 2nd and 3rd trimester,
Multiple pregnancy,
Placenta praevia,
Recent traumas and surgeries.

**Table 1:** Contraindications for massage in pregnant women [19].

## Intervention

DTM was performed twice a week, over the period from 22 October to 30 November 2015. There were twelve 30-minutes sessions in total. After medical consultation the patient herself decided on the treatment of deep tissue massage.

DTM is characterised by using a small amount of lubricant. The amount used should be sufficient for the therapist's hand to exert pressure on the tissues and affect them, but not too much to avoid sliding on the patient's body. Strokes are slow. Usually when the patient reports pain during the stroke, it is not a question of massage depth, but its speed. The angle between the therapist's lower arm and the massaged tissue should be less than 45° [20]. The essence of the

treatments is not only work with muscles, but also with a tendon which attaches it to the bone.

DTM included appropriate pressure, combination of lengthening strokes, anchor and stretch technique, releasing muscle adhesions, strokes in intermuscular grooves [21]. Each session began with the patient in a side-lying position, with pillows positioned behind her back and between her legs for support. The massage was performed by a certified physiotherapist who had undergone training in DTM.

## Outcome measures

For the assessment of the effects of DTM the following questionnaires were used:

- Modified Roland-Morris Disability Questionnaire (RDQ) [22] - is a health status measure designed to be completed by patients to assess physical disability due to low back pain. The RDQ score is calculated by adding up the number of items checked. The scores therefore range from 0 (no disability) to 24 (maximum disability);
- Modified Oswestry Low Back Pain Disability Index (ODI) [22] - is a tool that measures a patient's permanent functional disability. The test is considered the 'gold standard' of low back functional outcome tools. The scores therefore range from 0 (no disability) to 50 (maximum disability). The result is calculated from the formula;
- Quebec Back Pain Disability Scale (QBPD) [23] - this questionnaire is about the way your back pain is affecting your daily life. The minimum score is 20 and the maximum score is 100. Higher scores correlate to greater disability;
- The Numeric Rating Scale (NRS) is an 11-point scale for patient self-reporting of pain [24].

The patient was examined on day 0 before treatment and on the last day after treatment by physiotherapist.

## Results

The study showed that DTM resulted in an 18% (3 points) improvement of functional capacity according to the RDQ questionnaire (calculated in a formula) and QBPD test score by 9% (11 points). The score obtained in the ODI questionnaire decreased from 48% to 31%, which shows also an improvement in functional capacity by 17% (17 points).

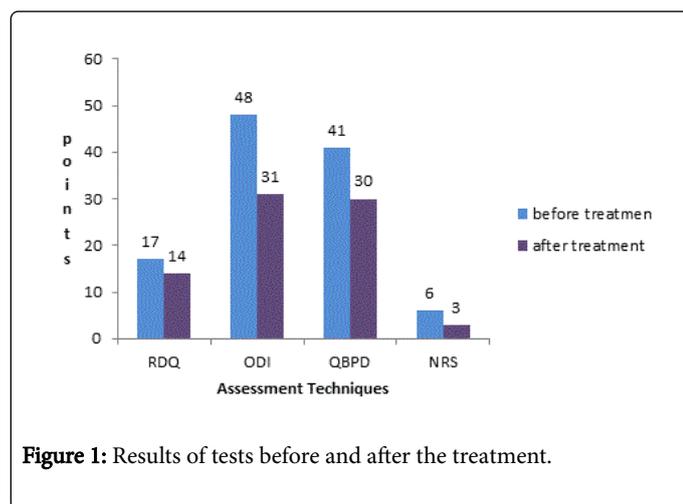
The subjective perception of pain decreased from 6 points before the therapy to 3 points after the therapy in the NRS scale.

## Discussion

There are only a few studies on non-pharmacological treatment of low back pain in pregnancy. The current study is the first one to assess the effect of DTM on perception of pain and functional capacity of pregnant women. This study showed that twelve 30-minutes sessions of DTM decreased low back pain and increased functional capacity of pregnant women (Figure 1).

It seems that low back pain in pregnancy is not related to structural changes in the spine [25]. It is believed that an increase in weight does not cause pain in this group of women [26]. However, an increased BMI results in a higher incidence of pain [27]. The greatest pain is experienced by women between the fifth and seventh month of pregnancy [28], which is before the period of the largest increase in weight and often the incidence of pain decreases at the very end of

pregnancy [29]. It was also noted that increased lumbar spine lordosis does not correlate with pain in this part of spine [30]. It was reported that the pain intensifies more often in the standing position than in the sitting position; therefore muscles were noted as the possible cause of the complaint [31]. Another factor which may cause low back pain in pregnant women is the effect of hormones, in particular relaxin, which relaxes ligaments while increasing joint instability [32]. However, no complete correlation between the concentration of relaxin and intensity of pain was noted [26]. Spinal disc herniation in pregnancy is rare, but possible. It is estimated that it causes lumbosacral pain in 1 in 10,000 pregnant women [33].



In the general population massage improved pain for acute, sub-acute and chronic non-specific LBP [34], reduced the intensity of pain and improved patient's functionality in patients with chronic lumbosacral pain [34]. Massage therapy was selected by The Philadelphia Panel as one of possible rehabilitation interventions to formulate evidence-based practice guidelines (EBPGs) for the management of lower back pain [35]. So far there are only two studies which show effectiveness of DTM in the treatment of low back pain in general population. DTM decreased chronic lumbar pain and may help to reduce the use of NSAID in such condition [36]. Romanowski et al. [21] showed stronger effectiveness of deep tissue massage in comparison to therapeutic massage with regard to patient's pain sensation.

The methods used so far for relieving low back pain in pregnancy are: chiropractic manipulation, osteopathic manipulation, exercises such as stabilisation training, water gymnastics, education [37], massage [12-14], acupuncture [9]. The current study is also the evidence of that.

Massage increases the level of serotonin which can alleviate leg and back pain [14]. Massage in pregnant women results in a decrease in leg and back pain, probably as a result of reduction in the amount of substance P [38]. The analgesic effect of massage can also be explained with a gate control theory of pain [39]. According to this theory, information from receptors stimulated during massage reaches the brain more quickly than information from nociceptors.

Massage is an effective therapy which relieves pain and anxiety [36] and reduced pain perception during labour [40]. This is consistent with the results of our research. More than 60% of providers of prenatal health care recommends Complementary and Alternative Medicine (CAM) as treatment for LBP for their pregnant patients. Massage is

one of CAM therapies and it was in the five most recommended treatment options [15].

The latest studies using magnetic resonance imaging have shown that massage results in an increase of blood flow in a number of regions of brain responsible for regulation of depression and stress, including amygdale and hypothalamus in general population [41]. It may have influence on our emotions [42]. Such results may be beneficial also for pregnant women.

Nilsson-Wikmar et al. [43] demonstrated an improvement in functional capacity in pregnant women after the therapy: home exercise, information, clinic exercise but there were no statistically significant differences between groups. The studies of effects of physical exercise in pregnant women relate mainly to an increase in muscular strength and improved flexibility [44]. In our study improvement in functional capacity in pregnant women probably was related to the decrease in pain sensation.

In this particular study deep tissue massage decreased low back pain and improved functional capacity of pregnant women. Future trials could provide additional useful information about the effects of massage. Further studies in the area of effective treatment for relieving pain in pregnant woman are needed.

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from individual participant included in the study.

## Conflict of Interest

Authors declare no conflict of interest

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