



Clinical Case Report Competition

West Coast College of Massage Therapy,
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Third Place Winner

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Treatment of pain and discomfort during pregnancy using massage therapy and muscle energy techniques: A case study

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Conflict of Interest and Consent Notification

To the authors' knowledge, no conflict of interest exists.

Informed consent was received from the patient prior to treatment. No personal information was revealed in the production of this paper.

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Abstract

Objective: To treat musculoskeletal pain experienced during pregnancy using massage therapy and muscle energy techniques.

Clinical Features: The patient is a twenty-nine year old female who during this case study was between her sixth and ninth month of pregnancy. This is the patient's first pregnancy. The patient is hoping massage therapy will help with bio-mechanical changes, stress levels and pain. The patient is experiencing pain in her right sacroiliac joint, mid/low back, and some mild discomfort in her neck and shoulders.

Methods: Two seventy minute appointments of assessment, seven seventy minute treatments and a final seventy minute appointment of re-assessment were performed during a three month period. Massage therapy techniques were performed to the patient's hips, back, neck and shoulders to try and decrease musculoskeletal discomfort. Muscle energy techniques were applied to the patient's sacrum as well as the patient's right and left innominates in hopes of decreasing right sided sacroiliac pain.

Results: The outcome was complete relief of the patient's right sacroiliac pain and relief from back, neck and shoulder pain lasting three to four days post massage.

Conclusion: Massage therapy and muscle energy techniques proved effective in treating musculoskeletal pain and discomfort experienced during pregnancy.

Key Words: massage therapy, pregnancy, muscle energy techniques

Introduction

Pregnancy is defined as “A state of wellness associated with many interrelated changes that occur throughout the woman's body as the fetus develops ¹.” A woman's body is intricately designed to be able to support life inside of her for nine months; consequently her body undergoes major changes during the pregnancy. During her pregnancy a woman can develop a vast array of symptoms and complaints. Some generalizations can be made about what signs and symptoms a pregnant woman may present with but it is important to remember that each woman is unique.

Massage therapy has been and is continuing to be used for a wide variety of reasons during pregnancy. A literature review conducted in 2011 found that “the general trend indicates that a significant number of pregnant women use complementary and alternative medicine. Common modalities used include massage...relaxation therapies and aromatherapy. Reasons for use are varied and include the belief that these therapies offer safe alternatives to pharmaceuticals, they allow greater choice and control over the childbearing experience, and are congruent with their holistic health beliefs².” A study conducted in Poland in November of 2010 on low back pain and pregnancy found that “Pain of the lumbosacral segment of the vertebral column and the pelvis concerns about 45% of all pregnant women....³”

Some of the indications for massage therapy during pregnancy are local swelling, referred pain, pain due to muscle imbalance, bony misalignment, peripheral neuropathies, sore feet, headaches, muscle pain, and changes in movement patterns⁴. Massage therapy may help reduce general muscle tension and pain, decrease stress, depression and anxiety, improve mood and sleep, decrease back and pelvic pain, reduce headaches, manage symptoms of edema and sciatica just to name a few.

Pregnancy is broken up into three trimesters. The first trimester is zero to twelve weeks. The second trimester is thirteen to twenty-six weeks and the third trimester is twenty-seven to forty weeks.

The changes experienced during pregnancy affect nearly every organ and system in the body. For the purposes of this case study the changes affecting the musculoskeletal system is what will be focused on.

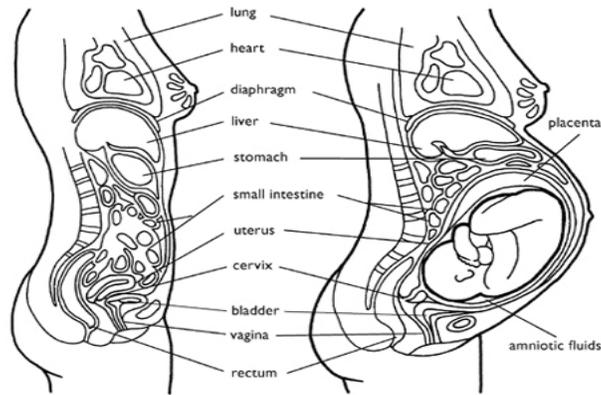
During the first trimester the endocrine system is no exception to the vast amount of changes that are occurring in the body. The hormone relaxin can be released in the body as early as two weeks into the pregnancy. Relaxin concentration is highest during the first trimester; it then falls to approximately twenty percent throughout the rest of the pregnancy. Relaxin causes joint capsules, ligaments, and fascia to become more elasticized. These changes make joints more vulnerable, especially joints such as the ankle, pubic symphysis and sacroiliac joint which all play a role in weight bearing.

It is very common for a pregnant woman to experience back pain. This pain could be felt in any area of the back and will vary greatly in terms of severity. The combination of ligaments, tendons, fascia and muscles being stretched and becoming more elasticized and the increase in stomach size causes extra stress on the back. The pain the mother is experiencing in her back often causes her posture to become progressively worse because it is so tiring to try and maintain good posture. Unfortunately, poor posture can cause increased pain. This is a cycle that will continue throughout pregnancy.

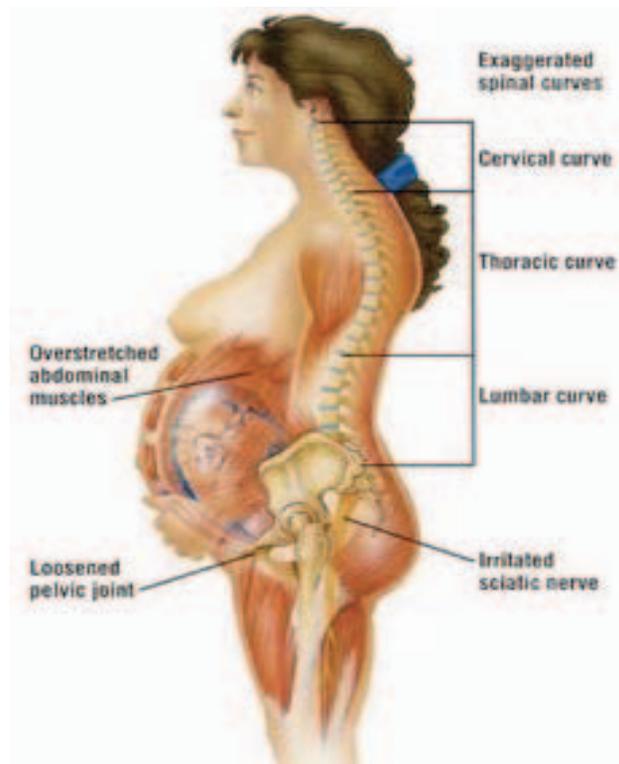
As the woman enters her third trimester of pregnancy many of the same symptoms are experienced and are often intensified. Sacroiliac pain is also quite common and could be due to one or both of the innominate bones changing position which may result in pain felt around the sacroiliac joint. The sacrum can also easily become displaced during the pregnancy which may cause a great amount of pain.

Costal margin pain is often experienced in the later stages of pregnancy. The mother may express that she is finding it hard to breathe. One of the reasons for this could be that the ribs are not able to expand as far anymore.

The picture below⁵ gives a representation of how majorly the internal organs are displaced to make room as the fetus grows.



This picture⁵ gives an idea of what pregnancy does to the mother's musculoskeletal anatomy.



Patient History

The patient is a twenty-nine year old female who as of March 21st, 2011 is twenty-two weeks pregnant. This is the patient's first pregnancy.

The patient has had problems with anxiety in the past and present. She has a history of muscle spasms, muscle tension and muscle strains.

The patient is taking pregnancy vitamins and an iron supplement. When she does not

take her iron she has reported that she feels quite tired. Occasionally she is also taking an anti-anxiety medication called Amitriptyline to help her sleep.

Since the pregnancy she has received two massage therapy treatments that consisted of light General Swedish Massage⁶. She has also received chiropractic treatments approximately once a month for hip pain. The chiropractor performed deep tissue work on the hip and gluteal areas as well as doing a hip adjustment. The patient finds the chiropractic treatments help for approximately a week until she has to work on her feet again.

The patient has experienced midback and neck pain on and off for the last ten years. The hip pain she is currently experiencing has developed since her pregnancy and varies in severity. This pain is specific to her right sacroiliac joint. The pain she is experiencing in her back and hip starts to get worse in the late afternoon/evening. Standing or sitting for long periods of time aggravates her back and hips.

She is currently working weekends doing banquet serving which increases her pain because she is on her feet for approximately six hours at a time. During the week she is a full time student. The patient has reported that at the end of the day if she is really sore she will go to bed to relieve the pain. She is finding that sleeping on her back with her legs bent to ninety degrees decreases the pain.

The patient reports that her posture before pregnancy was not great and that it is slowly getting worse as her center of gravity changes. Sitting and standing up straight gets tiring so she finds she ends up slouching or leaning back into the chair.

The only activity of daily living she finds is really affected at this point is that she cannot work as long and after working she does not want to do anything because of how much pain she is in.

Methods

The following scales and questionnaire were used during the assessment and throughout the treatments, the Pain scale⁶, Visual analog scale⁷ and the Oswestry Disability Questionnaire⁸. These scales and questionnaires were used to gain a better understanding of how the pregnancy is affecting the patient's activities of daily living as well as where her pain level is at. Please refer to appendix one and two on page 18 and 19 for explanation and visuals of these scales and questionnaire. The patient was also asked to keep a journal of when she did her homecare and

how she was feeling day to day.

Patient Observation

Following is a list of physical and postural observations as seen on March 22nd, 2011.

The patient has an increase in both the lordosis of the lumbar spine and the kyphosis of the thoracic spine. She presents with a slight knee valgus. It was noted that in a standing rest position the patient hyperextends her knees. There is a slight head forward posture and her shoulders are anteriorly rotated. The patient's arms are slightly internally rotated. The patient's right foot has less of an arch compared to the left. The patient's left shoulder is slightly higher than the right.

Assessment and Treatment

The subject was treated ten times between March 22nd, 2011 and June 23rd, 2011. Each treatment was seventy minutes in length. The primary goal of all treatments was to decrease pain and discomfort experienced during pregnancy. Specific goals were to decrease right sided sacroiliac pain, decrease mid and low back pain, and decrease shoulder and neck tension.

Each treatment a postural scan was done. Findings were consistent with the original postural scan done on March 22nd, 2011. The changes became more dramatic as the pregnancy wore on.

On March 22nd, 2011 and June 23rd, 2011 a plumb line assessment⁹ was performed. Please see appendix 3 on page 20 and 21

Each treatment the patient filled out a Visual Analog Scale⁷ and an Oswestry Pain Questionnaire⁸.

Table 1: Patient's VAS responses for her shoulders(☀), upper/lower back(☐), and hips(♠)

	Not Hurting, No Discomfort	Mild Discomfort	Quite uncomfortable, but not to the point of extreme pain	Hurting a lot, very uncomfortable, Severe pain
Treatment 1	☀ ♠		☐	
Treatment 2		☀ ☐ ♠		
Treatment 3		☀ ☐		♠

Treatment 4			☀	☐	♠	
Treatment 5		☀	☐		♠	
Treatment 6			♠	☀	☐	
Treatment 7		☀	☐	♠		
Treatment 8		☀	☐	♠		
Treatment 9			♠	☀	☐	
Treatment 10	♠	☀			☐	

Oswestry Pain Questionnaire Results

Each section of this questionnaire has a choice of six answers:A-F. A indicates the least amount of pain or problems experienced with that category, F indicates the most amount of pain or problems experienced with that category. Please see appendix 2 for an explanation of this questionnaire. This chart was designed to give a quick understanding of the patient's answers to the questionnaire throughout the case report.

Table 2:

Tx #	Pain Intensity	Personal Care	Lifting	Walking	Sitting	Standing	Sleeping	Social Life	Traveling	Changing Degree of Pain
1	B	A	E	B	C	C	B	A	B	D
2	C	A	B	C	C	C	B	A	B	B
3	C	A	C	C	C	C	B	A	B	B
4	C	A	C	C	C	C	B	A	C	C
5	C	A	C	C	C	C	A	A	B	C
6	C	A	B	C	C	C	B	A	B	C
7	A	B	C	C	C	C	A	A	A	B
8	A	B	C	C	C	C	A	A	A	A
9	A	A	C	C	C	C	A	A	A	A

10	B	A	C	C	C	C	B	A	A	A
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Testing performed treatments 1-10

*SAA=same as above

The three points checked during leg length assessment¹⁰ were the medial malleoli, inferior aspects of the patella and the anterior superior iliac spines bilaterally.

Table 3: Special Tests Performed Throughout Treatments

Treatment Number	Standing Flexion ¹²	Seated Flexion ¹²	Gillet's Test ¹	Supine to Sit ¹	Leg Lengths ¹²	Sphinx ¹²	Sulci Depths ¹²
2	+ on L	+ on L	- bilaterally	Not done	All 3 points longer on L	Not performed	Not performed
3	+ on L	+ on L	SAA	+ reversed on R	SAA	More uneven L goes higher	No notable difference
4	+ on L	+ on L	SAA	Evens out	SAA	L slightly deeper	No notable difference
5	+ on L	+ on L	SAA	Evens out	SAA	No notable difference	No notable difference
6	+ on L	+ on L	SAA	Evens out	SAA	SAA	SAA
7	+ on L	+ on L	SAA	Evens out	SAA	SAA	SAA
8	- bilaterally	-bilaterally	SAA	Evens out	SAA	SAA	SAA

9	- bilaterally	-bilaterally	SAA	Evens out	SAA	SAA	SAA
10	- bilaterally	-bilaterally	SAA	Evens out	SAA	SAA	SAA

Treatments one and two consisted of a thorough initial history and assessment.

Core Elements of Treatments Three through Ten:

All treatments were performed with the patient either prone using pregnancy pillows or supine. General Swedish Massage⁶ was performed to the patient's back, neck and shoulders in hopes of decreasing muscle hypertonicity, reducing muscular pain due to ischemia, increasing local tissue circulation and releasing adhered muscle tissue⁶. Throughout the ten treatments muscle stripping was performed to quadratus lumborum, pectoralis major and minor, intercostals, gluteals, scalenes, levator scapula, trapezius, erectors, and iliopsoas in each treatment depending on the indications for that day. This was done in hopes that muscle fibers would lengthen and relax and help relieve signs and symptoms of myofascial pain⁶. Myofascial techniques were performed to the patient's upper back and chest aiming to decrease adhesions within the fascial layers⁶. Contract relax stretching was performed on the patients pectoralis minor, hamstrings and quadriceps to increase the length of said muscles¹⁰. Trigger point release¹¹ was used occasionally on the patient's quadriceps. Each treatment involved muscle energy techniques¹⁰ to the patient's innominates and sacrum. Each treatment varied slightly in which muscle energy correction was applied. Please see discussion on page 14 for explanation.

Table 4: Muscle energy techniques¹⁰ performed treatments three through ten

Treatment Number	Anterior Left Innominate	Posterior Right Innominate	Anterior Sacrum	Posterior Sacrum
3		√		√
4	√			√
5	√	√		
6	√		√	
7	√		√	

8	√			
9	√	√		

****Please Note:** Due to scheduling conflicts the next series of appointments occur from the start of May 2011 through to the end of June 2011. There was a month gap between treatment number five and treatment number six.

Table 5: Homecare Given Throughout Treatments

Treatment Number	Pectoralis Major and Minor Stretch	Diastasi Recti Exercise²	Quadratus Lumborum Stretch	Quadriceps Stretch	Transverse Abdominus Contractions	Scalene Stretch
3	2x/day, hold 30 seconds	5 repetitions, 2x/day	2x/day, hold 30 seconds			
4		2x/day, hold 30 seconds		2x/day, hold 30 seconds		
5		SAA		SAA		
6		SAA		SAA		
7	2x/day, hold 30 seconds				5 sets, 3x/day	
8	2x/day, hold 30 seconds			L side 2x/day, hold 30 seconds		
9	SAA			SAA		
10	2x/day, hold					2x/day, hold

	30 seconds					30 seconds, bilaterally
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Homecare given was based on the pain and discomfort the patient was feeling that day, as well as what seemed to be indicated after palpation and treatment.

Discussion

When this case study was first started the patient was nearing the end of her fifth month of pregnancy. She was still able to move around on the table and during tests without much difficulty. Towards the end of the case study the patient was nearing the end of her eighth month of pregnancy and movement was becoming a lot more difficult. Consequently testing got quite a bit harder near the end of this project. Some of the tests were still able to be done without much trouble others could not be done at all.

Originally as the investigation began into the patients right sacroiliac pain it was very evident that her leg lengths were different. The left leg was consistently longer than the right, and the standing and seated flexion tests were always positive on the left. The confusing part came with the fact that the patient was experiencing pain on the right. Although the pain was on the right the theory became that perhaps the left sacroiliac joint was rotated anteriorly causing the left leg to be longer. The pain experienced in the right sacroiliac joint consequently being caused by the fact that the left sacroiliac joint was not moving properly causing the right side to take most of the weight and do most of movement.

Due to the pregnancy it was very difficult to assess whether or not the sacrum was stuck anterior or posterior. As of treatment eight both the standing and seated flexion tests¹⁰ were negative and the patient experienced no more right sided sacroiliac pain. However during the final assessment it was noted that the leg lengths¹⁰ were still very different, with the left leg appearing much longer than the right. It seems possible that the patient may have a leg length

problem caused by the pregnancy since she did not have it before. In terms of reproducibility this situation was not ideal. Due to the difficulty with testing it was hard to tell which of the corrections performed during these treatments was most effective.

It seemed that it would have been beneficial for the patient to be treated twice a week, to break the pain tension cycle and hopefully alleviate more of her pain and discomfort, since the patient was feeling good for approximately three to four days post treatment .

Conclusion

Massage therapy and muscle energy techniques¹⁰ proved effective in completely relieving right sided sacroiliac pain. Massage therapy proved effective in relieving back, shoulder and neck discomfort for three to four days post massage. Based on this study the conclusion is that massage therapy proved to be a very useful tool in managing discomfort that is inevitable during pregnancy.

In conclusion it is recommended that this patient continue to receive weekly massage treatments to aid in the relief of the discomfort she is feeling in her back, neck and shoulders.

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Appendix 1

Pain Scale⁶

The patient is asked to assign a number to their pain or discomfort from zero to ten. Zero represents no pain at all, ten represents excruciating pain.

Visual Analog Scale⁷

This scale is a psychometric response scale. It is a measurement instrument for subjective characteristics or attitudes that cannot be directly measured. When responding to a visual analog scale respondents specify their level or agreement to a statement by indicating a position along a continuous line between two points. Below is an example of the VAS used in this case study.



Appendix 2

Oswestry Disability Questionnaire⁸

This questionnaire was designed to give information as to how back or hip pain is affecting a patient's ability to manage in everyday life. The patient answers a series of statements by checking the box that best describes how that statement applies to them. This questionnaire has been around for 25 years and is a very valuable tool in assessing a patient's function disability.

Please see Oswestry Disability Pain Index Revised

http://www.chirogeek.com/001_Oswestry_20.htm.

Plumb Line Assessment⁹

Uses: To gather assessment information, monitor patient progress, note positional changes, and overall observation.

Procedure:

Explain procedure to client

Observe client in three different positions: anterior, lateral (x2), and posterior.

Plumb line is suspended from the ceiling to be used as an alignment device.

The assessment should be performed from the feet up to head.

Appendix 3

Plumb Line¹⁰ Pictures Taken March 22nd, 2011



