



Clinical Case Report Competition

Utopia Academy

Spring 2010

Third Place Winner

Marianne Hansen

If massage therapy is applied in a hydrotherapy pool, then the discomforts of pregnancy during second/third trimester will be relieved: A case study

Abstract

Objective: The objective of this study was to investigate the efficacy of massage therapy applied in a hydrotherapy pool to relieve the discomforts of pregnancy during the 2nd and 3rd trimester.

Methods: A treatment protocol was implemented during 10 one-hour massage treatment sessions over two months. Massage techniques including Swedish, trigger point release, myofascial release, assisted passive stretching, spinal decompression, were adapted to the water using buoyancy, drag and turbulence, hydrostatic pressure, to assist the therapist in applying the techniques. The focus was to relieve areas of discomfort, including hypertonicity and pain, mainly in the neck and upper shoulders, rib cage, low back and hips, legs and feet. Weekly assessments of gait, muscle tonicity, and reported levels of pain were used to establish results.

Results: The subject experienced upper shoulder, neck, low back, leg and foot pain as she progressed from the 2nd to 3rd trimester of pregnancy and continued to work. These symptoms were relieved for a period of 2 – 3 days with massage treatments in the hydrotherapy pool. As the subject was able to reduce her work duties by training new staff, the symptoms were relieved for a longer period of time and reduced to only the areas of the hips, legs, feet and abdominopelvic region. When the subject stopped working the symptoms were completely relieved with massage treatments in the hydrotherapy pool.

Conclusion: Results indicated that massage therapy applied in a hydrotherapy pool can relieve discomforts of pregnancy during the 2nd and 3rd trimester.

Keywords: hydrotherapy pool, 2nd or 3rd trimester of pregnancy, massage therapy, aquatic massage, range of motion

Introduction

During the 3rd trimester of pregnancy, the weight of the growing baby, the postural shifts, and the movement of the internal organs may cause discomfort for the pregnant woman.

(Mosby, 2004) As the fetus continues to grow, lumbosacral joint compression, and lumbar and pelvic muscular strain can be severe. (Osbourne-Sheets, 1998)

Left untreated these areas of discomfort can turn to areas of dysfunction causing women in the work-force to leave work earlier and even lead to conditions requiring hospitalization before giving birth.

Osbourne-Sheets (1998) indicates that massage can reduce musculoskeletal strain and pain particularly in the back and pelvis but also including the arms, hips, legs and feet, improve respiratory and gastrointestinal function, improve urinary function, reduce edema, and improve physiological functioning through skin stimulation.

The subject had received a pregnancy massage treatment on land and felt it was beneficial, but she would not consider it on a regular basis due to the difficulty of moving on the massage table, and the application of pressure was not comfortable. By moving the treatment to a hydrotherapy pool, the awkwardness of the land treatment was reduced. A

study done comparing the effect of a land-based, physical exercise program versus water aerobics on low back pain or pelvic pain and sick leave during pregnancy found that water aerobics was more effective than land-based exercises. (Grannath, 2006)

The primary benefit of using a hydrotherapy pool for massage treatment is the reduction of weight-bearing forces through buoyancy. When in water, people feel lighter, move easier and feel less pressure on the joints, and in the case of pregnancy, feel less pressure in the adominopelvic cavity. Other water principles can be applied to enhance massage techniques without direct localized pressure, including drag and turbulence. Drag relates to the amount of resistance against an object being moved through the water and turbulence relates to the amount of pressure behind an object that holds it back while it is moving through the water. There is also a relationship between the velocity of the object moving through the water and the increase of drag force, which can be used effectively with different treatment techniques.

The submerged body encounters resistance in all directions of movement in a uniform manner, with the resistive force being equal to the amount pressure created by the movement of the body. This is important for the massage therapist, as less work is required for the application of techniques.

Hydrostatic pressure also plays an important role when a body is submerged. It directly opposes the tendency of fluid to pool in the lower extremities, helps stabilize unstable joints, and resists chest wall expansion thereby exercising the respiratory muscles.

(Hanson, 1996) All of these factors are important when addressing the changes that occur during pregnancy.

The temperature of the water is critical, as the subject is not actively engaged in movement. With ideal temperature, the body can relax and the water can facilitate pain management. Heat loss to water is 25 times that to air at a given temperature and if more heat is lost to water than is produced by the muscles, the person will feel cold. (Hanson, 1996) It has been found that the ideal temperature for treatment is 33°C - 34°C, which is neutral body temperature. In the case of pregnancy where the core temperature can be elevated during gestation it is important to consider lowering the temperature to 32°C. Sensory feedback from the water is ideal for proprioceptive training, which is altered during pregnancy. Vertical treatments of walking can assist in helping a pregnant women adjust to the changing center of gravity as the fetus grows.

When submerged and receiving massage, the pregnant woman is receiving sensory stimulation to the skin from the water and the manual therapy. Stimulation of the skin stimulates the brain in a way that creates positive effects in all body, and touch during pregnancy has been found to promote secretion of hormones that improve pregnancy outcomes and produce appropriate mothering behaviors. Osbourne-Sheets (1998)

The purpose of this case study was to look at the efficacy of massage therapy applied in a hydrotherapy pool to relieve the discomforts of pregnancy during the second/third trimester. The treatment protocol was designed to address the whole body. It could be used for future studies to further develop effective treatment plans and techniques.

Case History

Subject was a healthy 36 year-old female who was 28 weeks pregnant and working full-time as a professional baker. Her job involved long periods of standing while reaching in

front with her arms to perform stirring of large volumes of batter. During the middle of the study, she was able to reduce the amount of labor while training a new employee, however still continued to have long periods of standing. She was able to quit working while receiving the last four sessions of aquatic massage therapy.

Symptoms included pain in the hips, legs and feet; hypertonicity in the upper trapezius, scalenes, levator scapula, sternocleidomastoid, deltoid, rhomboids, and gastrocnemius. Slight edema was noted in the ankles and feet. There was increasing discomfort in the abdominopelvic region during sitting, standing and lying down due to the growing fetus. The subject was woken several times during the night due to discomfort and pressure on the bladder increasing the need to void.

Activities that relieved the symptoms of pain and edema in the lower extremities included sitting and elevating the feet for 10 minutes or more.

Assessment

Use of pain scale before and after each treatment for areas of complaint that were treated including upper trapezius, pectoral group, sacral area, and greater trochanter area. The subject maintained a pain/comfort journal (see Appendix #1), which was reviewed at the beginning of each treatment.

The mobility of the spine and texture of the erector spinae were assessed by gently 'pushing and pulling' along the full length of the spine using the erector spinae muscles, while in a supine position. Mobility of the glenohumeral joint and acetabulofemoral joint were assessed by anchoring one hand at various levels on the spine, thoracic and lumbar, while the other hand tractioned the cervical spine using the occiput, the body was

propelled feet forward through the water while supine, which causes the legs and arms to abduct due to the counterforce of the water against the limbs. The tonicity of the upper trapezius, rhomboids, scalenes, levator scapula, and sternocleidomastoid, were assessed using palpation, while supporting the occiput with the subject supine.

Treatment Plan

Horizontal positioning was accomplished by use of flotation devices including a soft neck float, soft 'noodle' and neoprene band leg floats while the practitioner used strategic placement of their hands and feet to support, move and massage the body. The use of the principles of water such as buoyancy, drag, turbulence, flow, hydrostatic pressure and tactile stimulation were used to assist in the application of massage techniques. Passive influences of the water on the body such as hydrostatic pressure, the effects of temperature of warm water, which relaxes the muscles, tendons and ligaments, and the soothing nature of being passively floated and moved through warm water were also taken into consideration.

Pre-treatment assessment of gait in a accomplished in the water in a vertical position.

Assessment of hypertonicity of muscles of the back and upper shoulders using passive range of motion was done in a horizontal position. Leg floats were placed around the thighs, 2 – 3 inches above the knee prior to the beginning of the treatment.

The massage began with the introduction of diaphragmatic breathing prior to being taken in to a horizontal floating position by the practitioner. Hydrostatic pressure provides

resistance throughout the treatment to the muscles of respiration. When moving from vertical to horizontal, the practitioner uses the occiput to keep the face out of the water while the subject leans back. Turbulence and buoyancy are used as the subject is guided head first through the water to passively lift the feet off the pool floor to a supine horizontal floating position. The priority of the practitioner is to maintain the integrity of the spine while keeping the face above the surface of the water.

Spine mobility is assessed using a gentle 'push – pull' motion using the erector spinae.

The practitioner is able to introduce their touch and the subject is physically cued to relax and physically 'let go' at this point.



Decompression of the spine was achieved by anchoring the foot of the practitioner on the sacrum with their hands at the occiput, and lengthening the distance between them.

Passive stretching of the shoulder and neck muscles was achieved by using drag with movement throughout the ranges of motion. Myofascial techniques and triggerpoint release were used on the upper trapezius, levator scapula, and pectoralis minor muscles bilaterally while continuing to move the body cephalically through the water. Pin and stretch techniques combined with traction and drag were used for pectoralis major.



Passive stretching of tricep, intercostal and quadratus lumborum muscles was achieved by using the subjects upper arm as a lever with the glenohumeral joint in flexion and using drag to extend the lateral side of the body bilaterally.

In order to treat the lower segments of the body, a soft head float replaced the hand used to support the head. It was placed under the occiput, keeping the face up and out of the water.



The lateral side of the body of the subject was elongated using the rib cage and the ilium as anchors and 'spreading' the arms of the practitioner open while the subject was rolled on her side. This also provides some gentle spinal rotation at the cervical spine.

Trigger points and tissue adhesions around the greater trochanter were addressed with the practitioner standing on one side of the body and tilting the far side into their hands, using the weight of the subjects' body to apply ischemic compression and deep tissue pressure.

Posterior rotation of the pelvis was achieved by placing a soft noodle under the posterior

knees. By moving the body caudally with the head supported in the neck float, the lumbar spine was passively decompressed.

The treatment to the legs was applied bilaterally. The soft noodle behind the knees was removed in order to massage the legs. Compression was applied to the hamstrings by the foot of the practitioner while the foot and lower leg were used as a point of stability. The triceps surae was stretched using dorsiflexion and holding for 30 – 60 seconds while moving the body towards the feet thereby utilizing turbulence and drag to assist the stretch. Lower leg edema was addressed by moving the foot from dorsiflexion to plantarflexion three times. The constant hydrostatic pressure plays a passive role in reducing edema.

Larger movements of the whole body were used for the last part of the treatment. Using the wrist and ankle of one side of the body, the body was pulled sideways through the body using drag to provide resistance and gentle stretching in abduction of the limbs of the body.

After removing the soft neck float, the occiput was supported on the shoulder of the practitioner and the body was moved in a serpentine motion (lateral side-to-side movement) while the practitioner walked backwards. This can be a 'playful' application that includes gentle spinal rotation, hip flexion and decompression of the postural joints. The session was completed with a few minutes of quiet supported floating, allowing for

‘unwinding’. The subject was then returned to a vertical position with the practitioner supporting the occiput and posterior knees while gently ‘docking’ the subjects’ back against the side of the pool and anchoring their feet to the floor.



When the subject had reoriented to a vertical position; walking forward, backward, and sideway was used to ensure the subject had regained vertical orientation and to engage the muscles of gait before moving back into a fully weight bearing environment.

Outcomes:

The objective of the study; to relieve the discomforts of pregnancy during the second/third trimester using a hydrotherapy pool, was actually accomplished in the first treatment and maintained throughout the 10 treatments. Although the time spent on each area varied slightly according to the hypertonicity or pain, the protocol remained much as the first treatment.

Prior to treatment the subject was experiencing pain in the lateral hip region when moving from a sitting position to standing, pain and slight edema in the lower legs and feet from long periods of standing, and hypertonicity in the upper back/shoulder and neck region from positioning at work. She was waking 3 – 4 times during the night due to discomfort of lying in one position and having to void. The symptoms were alleviated during treatment and would not return until 2 – 3 days after treatment. After the 4th treatment, the subject was able to reduce her work duties but still spent long periods of

time standing. The hypertonicity in the rhomboids, upper trapezius, levator scapula, scalenes, sternocleidomastoid, and rhomboids was reduced to nearly negligible. The pain and edema was relieved after treatment until the next day when she spent long hours standing at work. The fetus moved into a more distal position creating more discomfort in the lower abdominopelvic region, relief in pressure against the diaphragm making breathing easier, and an alteration in gait. The subjects' stance was widened to accommodate the lower position of the fetus resulting in a 'waddling' gait. Walking in the pool relieved the pressure of the fetus and allowed the subject to walk in a 'normal' fashion, thereby keeping the muscles of gait strengthened.

After the seventh session the client was able to quit work, which relieved the problem of spending long hours on her feet although she did increase the distance of walks that she would take. The sessions continued to maintain the reduction of hypertonicity in the upper body and reduced the pain and edema in the lower extremities to negligible. The subject continued to sleep well, but for short periods of time due to the increased pressure on the bladder with the low fetal position.

On the last treatment the subject noted the following areas of improvement: reduced hypertonicity in the upper body, decreased pain in the hip, legs and feet, relief of abdominopelvic pressure while in treatment, reduced edema in the lower legs and feet, improved quality of sleep, improved feeling of well-being in body, mind and spirit.

Conclusion:

The treatment protocol provided during the 10 treatments of this case study were effective in relieving the subjects' discomforts of pregnancy. The use of a hydrotherapy pool provided a comfortable alternative to receiving a massage on a table due to the

freedom of movement. The application of water principles enhanced the massage techniques used and made the application of them easier on the practitioner. The researchers look forward to repeating this study based on the success of the outcomes in this case and the lack of studies performed using a hydrotherapy pool for massage.

Appendix #1

Excerpts from the Sleep/Discomfort Diary

Post-Session 1

I felt so good after the session. It was so nice to be on my back floating in the water without discomfort. I slept very well the night after the session and last night as well. Still getting up to pee and not sleeping much, but sleeping well. I noticed that I had a very sore abdomen. Felt like stretched muscles across my belly button. Not sure if that was from the session or from me working?? It has gone away today though, maybe just my belly growing. The pain when I get up from sitting has not come back. My feet and legs felt great until after having to stand for most of the 8 hrs. at work. I noticed I had more movement in my shoulders and neck and work wasn't as hard as it has been. I think this is a great method of massage for anyone who is pregnant. Looking forward to the next session.

Post-Session 4

Have had 2 weeks where we have had sessions twice a week. It has felt great but it is hard to fit everything in with work, prenatal classes, etc. Next week we agreed to just meet twice a week. Am still getting up during the night but sleeping really soundly when I am sleeping. I am not having to do a lot of work as I am training new staff so my shoulders and between my shoulder blades feels good. but still spending long hours standing. Always feel great after a treatment, but with standing so much the pain and swelling comes back very quickly. I tried the heat on my hips and it really helped. I had no pain on Wednesday night. I also tried the tub thing with the hot and cold water. Made my feet feel better too. The baby has turned head down and dropped a bit. Feeling more pressure lower down and relief in the stomach.

Post-Session 7

I have finally quit work and notice a big difference. My legs and feet no longer hurt and the swelling has gone down. I sleep when I can, put my feet up a lot more. Generally take it easy. My stomach feels huge and it is getting harder to walk. The sessions are such a relief. The pressure of the baby is not so great. Am noticing it is even hard to walk when I'm in the water and my balance off. Still getting up at night, but sleeping much better and longer. Shoulders and arms feel much better. Low back pain and stiffness feels much better.

Post-Session 9

Next week is the last session. I am sorry that they are coming to an end. The pain in my legs and feet only returns when I overdo it and go for long hikes. My shoulders and neck feel great – no pain or stiffness. I am sleeping well even with getting up to pee. I feel very relaxed after the sessions, like I've been cared for. The water feels supportive and nourishing for the soul. I will say again that every woman who is pregnant should get a massage in the water.

References

Fritz, S., MS., 2004, Mosby's Fundamentals of Therapeutic Massage, 3rd Edition, Elsevier, Philadelphia, PA

Granath, A.B., Hellgren, M.S., Gunnarsson, R.K., 2006, Water Aerobics Reduces Sick Leave Due to Low Back Pain During Pregnancy, Journal of Obstetric, Gynecologic, and Neonatal Nursing, 35(4); 465-471

Hanson, N., Bates, A., 1996, Aquatic Exercise Therapy, W.B. Saunders and Co., USA

Osbourne-Sheets, C., 1998, Pre & Perinatal Massage Therapy: A Comprehensive Practitioners' Guide to Pregnancy, Labor, Postpartum, Body Therapy Associates

Photographs of techniques courtesy of Aquatic Integration

Rattray, F., Ludwig, L., 2005, Clinical Massage Therapy; Understanding, Assessing and Treating Over 70 Conditions, Talus Inc., Canada

Smith, S., Michel, Y., 2006, A Pilot Study on the Effects of Aquatic Exercises on Discomforts of Pregnancy, Journal of Obstetric, Gynecologic, and Neonatal Nursing, 35(3), 315-323