

What role does massage and medical intervention from the GP and mid wife play in supporting a Mother's exercise regime pre and post birth?

By Vanessa Mansergh

The subject of this project evolved from one of my first Case Studies, Mrs F whose dormant prolapsed cervical disc problem was exposed during pregnancy. This fact alone highlights the huge physiological changes that occur during pregnancy that the body has to adapt to. Mrs F was also a keen horse rider who only stopped riding at 20 weeks because of her neck problem and started riding again 6 weeks after a Caesarean. Exercise is vital to many and has huge benefits, both physically and emotionally for the Mother pre and post birth. This is supported by the Medical professional but not necessarily signposted early on in pregnancy according to Mrs C when the Mother could really benefit from strengthening her abdominal and pelvic floor muscles. Shiatsu massage is a hands-on therapy that incorporates corrective exercises, mobilisations, posture work and massage techniques to remedy common physical and hormonal problems experienced during pregnancy. This project will assess the roles of both the holistic and the medical approaches towards keeping the Mother active and healthy.

Why Exercise?

As Paula Radcliffe (the athlete) said in the Telegraph in 2006 "The athlete in me doesn't like being pregnant". The changes she was referring to were the extra weight gain and the muscle-relaxing hormone *relaxin* which meant her training regime had to be cut down from two to one 100 minute runs per day, gym work and aqua jogging or cross training. This exercise combined with her daily massage, and input from her coach and obstetrician to maintain her fitness, was manageable. Exercise clearly worked for Paula Radcliffe.

The benefits of exercise during pregnancy according to the Royal College of Obstetricians and Gynaecologists (RCOG) are as follows:

- Many common complaints of pregnancy, including fatigue, varicosities and swelling of extremities are reduced in women that exercise.
- Active women experience less insomnia, stress, anxiety and depression.
- Weight-bearing exercise throughout pregnancy can reduce the length of labour and decrease delivery complications.
- It helps in improving glycaemic control in women with gestational diabetes and may play a role in preventing it in the first place
- It helps protect against coronary heart disease, osteoporosis, and hypertension.
- It reduces the risk of colon cancer and perhaps breast cancer
- It reduces body fat

Whereas the downside of not exercising and leading a sedentary lifestyle during pregnancy is:

- Loss of cardiovascular and muscular fitness
- Excessive weight gain
- Raised risk of *gestational diabetes mellitus* . This is the presence of sugar in the urine which can happen naturally during pregnancy as there is more blood circulating around the body than normal and therefore more blood sugar to be dealt with by the kidneys.
- Raised risk of *pre-eclampsia*.

An important aspect of the monthly midwife checks is the Mother's blood pressure. Although slight fluctuations are normal during pregnancy, any significant rise may indicate pre-eclampsia. This has to occur alongside a raise in the level of uric acid in the blood for a positive diagnosis. The cause for this is that the placenta (nourishes foetus with nutrients and removes waste products) runs short of blood because the arteries of the womb did not enlarge as they should during the first half of pregnancy. This raises the Blood Pressure and disturbs the kidney function which in turn results in waste products which should be excreted accumulating in the blood while proteins leak into the urine. The baby grows more slowly without the vital nutrients and may be delivered prematurely. With no obvious symptoms, the only way pre-eclampsia can be detected is from the blood pressure and urine tests at an antenatal visit.

The real risk is that pre-eclampsia may develop into Eclampsia, although rare. The Mother has a fit or convulsion similar to an epileptic fit from 20 weeks onwards because of reduced blood flow to the brain from the build up of clots in the placenta, blocking the arteries and causing it to fail. Left untreated, eclampsia can develop into seizures and ultimately death.

Pre-eclampsia is the leading cause of maternal death in the world and kills- 63, 000/ year of which 99% of the deaths are in the developing world. There is no cure for pre-eclampsia or eclampsia other than delivery of the baby – often induced to prevent the mother becoming ill. This highlights the importance of hospitals, routine tests and early detection which the developed world can take for granted. The World Health Organisation recommends Epsom salts (injectable magnesium sulphate) as the safest and lowest cost medication. This has been the standard treatment in America for the last 20 years. Although for pre-eclampsia, the recommendations are bed rest and drugs to reduce high blood pressure to prolong the pregnancy as long as the baby is not distressed.

- Development of *varicose veins*.

This is where blood pools causing superficial veins to swell, usually in the legs. During pregnancy, hormonal changes raise the coagulants in the blood which slow down the flow which may add to problem. The varicose veins are not helped by the weight of the foetus later on in pregnancy pressing down onto the pelvic veins. Prolonged periods of sitting down with legs crossed and standing make this condition worse. Massage is recommended to relieve the oedema (swelling), increase venous flow and improve the condition of the smooth muscle found in the walls of veins.

- Increased incident of physical complaints such as *dyspnoea* (painful or laboured breathing) or lower back pain
- Poor psychological adjustment to the physical changes of pregnancy

Overall the indications are that exercise is important for pregnant Mothers pre and post birth for the many physical and psychological benefits. Medical intervention plays an important role in detecting and treating conditions such as pre-eclampsia which left untreated could be life threatening. The lack of medical intervention accounts for a high maternal mortality in the developing world. A massage therapist does not diagnose so plays a limited role in treating pre-eclampsia but most of the common problems such as varicose veins, aches and pains can be relieved with the correct techniques.

However, there is no guarantee that a midwife or doctor will recommend exercise to the Mother to avoid the negative side of a sedentary lifestyle or prepare the Mother for the huge physical changes during pregnancy with specific abdominal and pelvic floor exercises. Mrs C was upset that her first introduction to the importance of pelvic floor exercises was week 26 on an NCT (National Childbirth Trust) course when she had little hope of engaging the muscles with the weight of her uterus at approximately 600g (from 60-80g).

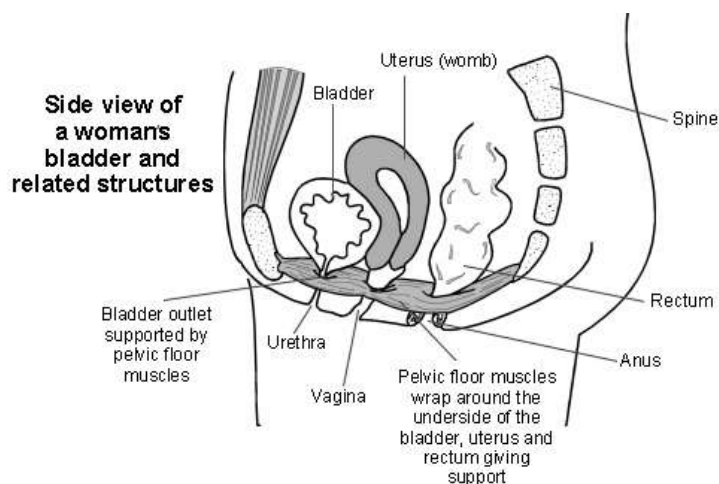


Figure 1: Location of the pelvic floor muscles

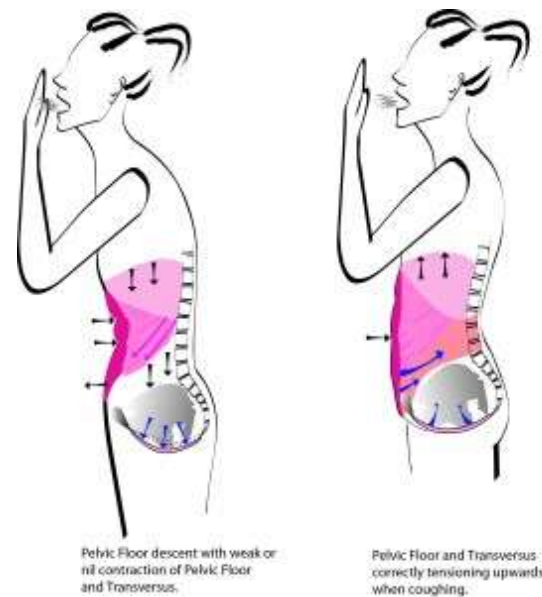


Fig 2: Engaging the pelvic floor and transversus muscles correctly on the right and not at all on the left while coughing

The pelvic floor muscles ideally form a firm and supportive sling between the pubic and the coccyx bones. Pregnancy and childbirth cause this sling to sag and become weak. Excessive sagging over a long period can cause structural changes which disrupt bladder and bowel function. The possible outcomes are incontinence (involuntary loss of urine when you cough, laugh, sneeze, lift or run), and prolapse of the uterus. These kinds of problems with the pelvic floor are so common that some doctors regard a firm efficient PF as an exception. It is normal for the PF to have descended about an inch by full term but regular exercises with instruction from a pilates teacher or pregnancy massage practitioner during pregnancy will prepare the body for the postpartum period.

The postpartum period is a priority as the body has had to adapt to the huge changes of the last 9 months. This period of rehabilitation is often neglected. It starts within 24 hours of delivery. Pelvic floor exercise will prevent muscle wasting and re-establish bladder and bowel control. Once they are functioning properly, abdominal exercises will help return the abdominal muscles to their normal length and later to strengthen them. Otherwise abdominal exercises may strain and weaken the pelvic floor muscles. Without good muscle support, the joints are at risk for some weeks because of the reversing hormonal effects of pregnancy and the additional hormone from breastfeeding. Daily corrective exercises for the recti muscles for a week or so will speed up recovery.

Physical Changes in Pregnancy

Movement of organs: By the end of the third trimester, the uterus takes up most of the pelvic cavity and weighs approximately 800-1200g (from non pregnant mass of 60-80g). It extends into the abdominal cavity and by the end of the third trimester, it almost reaches the xiphoid process of the sternum. This pushes the intestines, liver and stomach upwards,

elevates the diaphragm and widens the thoracic cavity. The contents of the stomach may be forced into the oesophagus. Possible side-effects: heart burn, pain under the ribs, indigestion, difficulty breathing, and an increase in urination.

Weight Gain: This is a combination of the foetus, amniotic fluid, placenta, uterine enlargement, increase in the total body water, increase in storage of proteins, triglycerides and minerals and breast enlargement. By the third trimester the uterus weighs approximately between 800-1200g. Possible side-effects: low back pain, thoracic pain, pressure on the bladder as pelvic floor lowers.

Postural Changes: From week 16 onwards, the extra weight at the front of the body has a direct impact on the centre of gravity moving it forwards causing postural problems as shown by Figure 3: forward leaning head, excessively rounded shoulders (weight of breasts), strain on the central seam from the rib cage to the coccyx including the abdominal, pubic bones and pelvic floor muscles, lumbar lordosis (excessive curvature of the spine), tight hamstrings, tight hip flexors, knees hyper extended and feet rolling in and arches sagging.

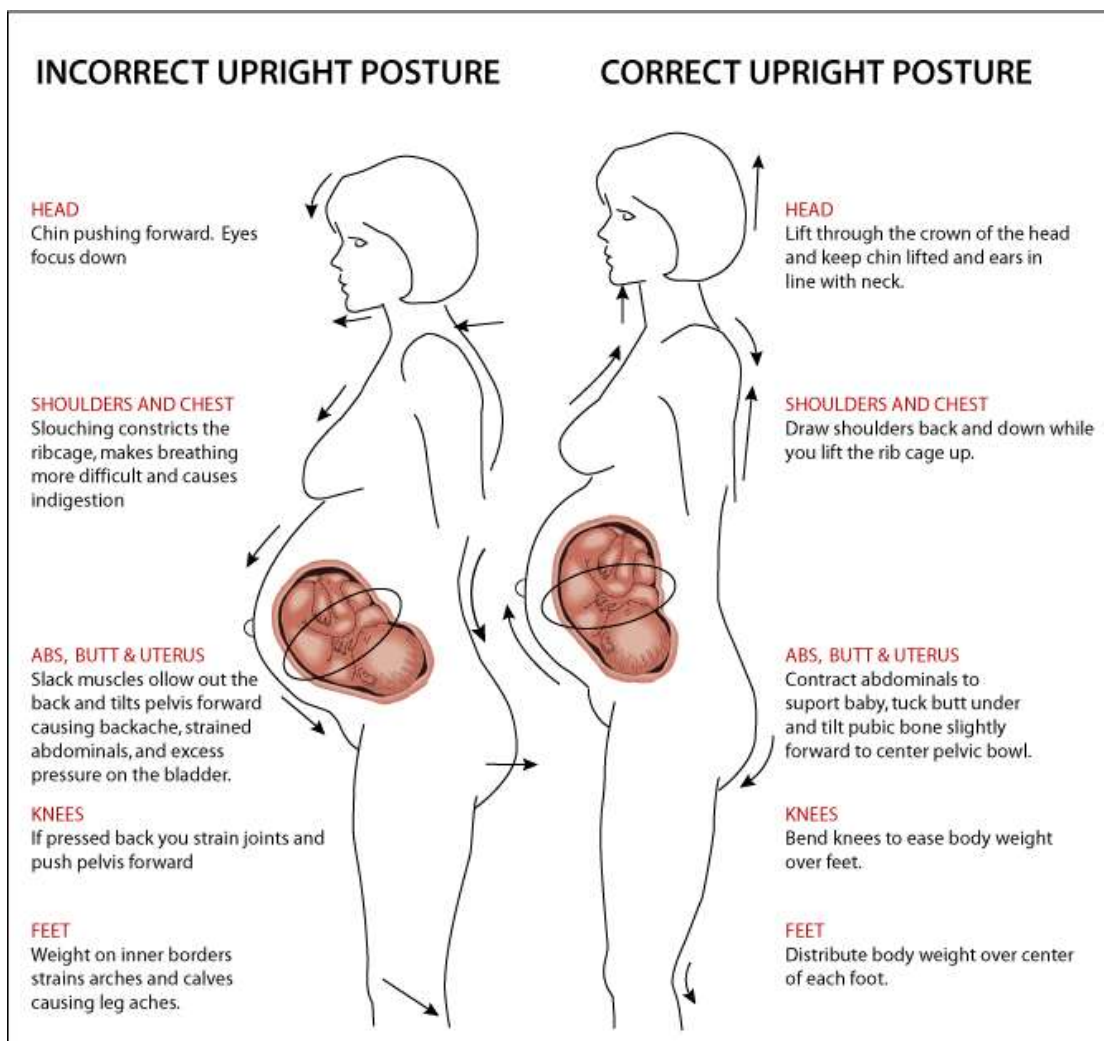


Figure 3: The Impact Pregnancy has on Posture on the left and how to correct it on the right

Cardiovascular System: The heart rate rises by 10-15% and the blood volume by 30-50% mainly during the second half of pregnancy to meet the additional demands for the foetus' nutrients and oxygen. Cardiac output increases by 20-30% due to the rise in the maternal blood flow to the placenta and higher metabolism.

Pulmonary Function: The tidal volume can increase by 30-40% as the foetus needs extra oxygen.

Gastrointestinal Tract: A reduction in its ability to mix and move food to the anus can cause constipation, delay gastric emptying time and cause nausea, vomiting and heart burn.

Hormonal Changes in Pregnancy

The *corpus luteum* which is the remnants of an ovulated follicle, produces progesterone, oestrogen, relaxin and inhibin. Among the many effects progesterone has on the body, it relaxes smooth muscle in the digestive track linings causing increased heart burn and reflux, and also relaxes smooth muscle in the uterus which maintains low blood pressure. Oestrogen or the “feminine hormones” have many effects on the body too including promoting mood stability. Relaxin is an insulin-like hormone secreted by the corpus luteum and later by the placenta. Along with progesterone, it is responsible for supporting many of the changes in the ligaments of the pelvis. It softens and relaxes the cartilage and connective tissue of the sacroiliac joints, the symphysis pubis, the pelvic ligaments and connective tissue to allow mobilisation and growth of the uterus into the abdomen and later on pelvic movement during birth. The pubic symphysis is the joint that joins the two hip bones at the front of the pelvic girdle. Together with the sacrum and coccyx – they form the pelvic girdle.

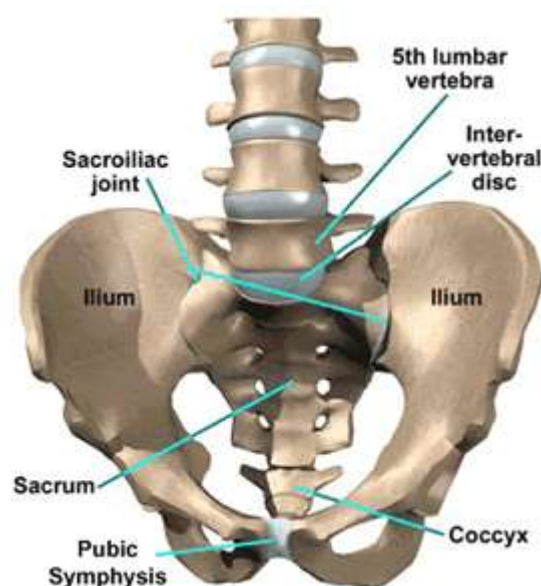


Figure 4: Pelvic Girdle

The pubic symphysis joint is vulnerable during pregnancy as no muscles protect this joint as it becomes more mobile. That means any asymmetrical movements where one leg moves differently from the other – such as walking, running or turning over in bed can cause pain if there is increased laxity of the joint. Exercise cannot compensate for this vulnerability and can actually make it worse.

Tiredness/Insomnia: The Mother is likely to feel exhausted at the beginning for the first three and the last three months of pregnancy when it is harder to sleep with the frequent trips to the toilet, the baby kicking and the worry about the birth. The main concerns about labour and post birth are pain, loss of control when the waters break, loss of dignity, fear of managing alone, fear of hospitals, episiotomy, health of the baby, change and social expectations including attractiveness.

These physical and hormonal changes all play an important role in affecting a Mother's general wellbeing but few of them will stop her exercising. It is her chosen sport which is the key factor. According to the Family Education sports guidelines in pregnancy, activities not recommended because of risk of falls/trauma to the abdomen are:

- Downhill skiing and waterskiing
- Hang gliding, sky diving
- Horseback riding
- Skating
- Gymnastics
- Rock climbing
- Scuba diving

And those activities with increased risk of abdominal injury are:

- Hockey (field and ice)
- Basketball
- Soccer
- Boxing
- Wrestling
- Football
- Martial arts with fighting

These risks are relative to a person's sporting ability and what their body is used to as my case study Mrs F proved. She was a competent horse rider before pregnancy, and although she stopped jumping, she would have happily carried on riding beyond 20 weeks if she had not suffered with her neck problem. The key factors to be aware of are proper hydration, additional nutritional requirements and the dangers of heat stress. For an elite athlete who continues to train at a high level during pregnancy, supervision by a medical professional (obstetrician) is advised by the RCOG.

The most common complaint from my case studies and friends during pregnancy which could interfere with exercise if acute enough is back pain from the extra weight the body is carrying. The spine is both strong and elastic. The spinal vertebrae are cushioned by discs which soften movement. These are squashed with pregnancy, so stretching and movement is vital to keep the fluid in the discs fluid. Part of a shiatsu massage is movement to address physical stiffness by mobilising the joints and stretching the spine to relieve back pain. Movement, postural assessment, specific massage techniques and corrective exercises all relieve the back and maintain its health. A useful position to relieve back pain is with the Mother on all fours from the second trimester onwards– resting on her hands, a pilates ball or a chair with a cushion. General relaxation of the sacrum and the lower back can be pain-relieving. Pressure techniques using palms or knuckles working with the breath down the sacrum and over the coccyx, thumb pressure in the sacral grooves (points BL31-34) and energy work all help to relieve the erector spinae group of muscles and the gluteals. The side-lying position from the second trimester onwards is ideal for deep work into the piriformis to release the buttocks and warming effleurage strokes either side of the spine help to lengthen and stretch the muscles of the lower back. Deeper friction techniques along the erector spinae muscles using thumb pressure, muscle stripping, and criss-cross movements can be followed by spinal rocking work.

Strengthening exercises for the abdominals also help to prevent the back muscles from taking on all the work to support the spine. A large part of massage treatment is education and encouraging the Mother to listen to her body and react to aches and pains. Many people have no idea that the abdominal muscles support the pelvis and the lumbar spine. It probably seems strange that muscles at the front of the body have anything to do with those at the back.

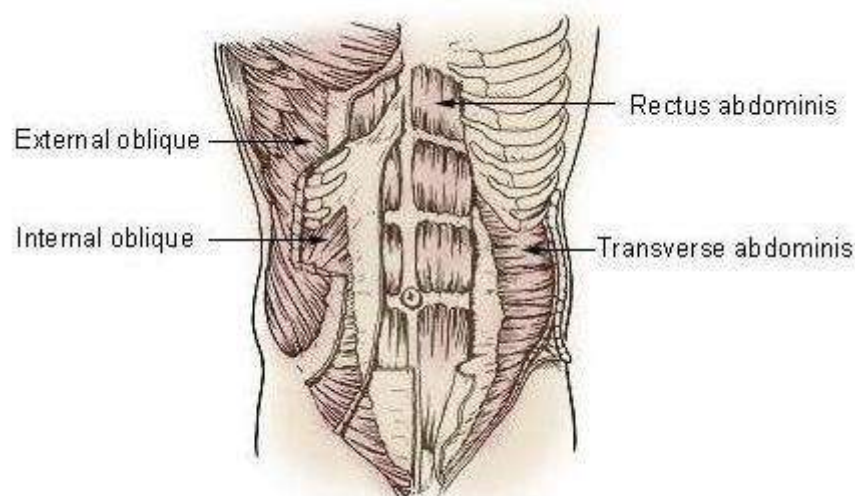


Figure 5: The abdominals

The abdominals form a complex corset type network of muscles. The two vertical recti muscles down the centre of the abdomen take on much of the load during pregnancy. Specific exercises can significantly help reduce recti muscle separation if it is considerable pre and post birth as it can prevent the Mother doing abdominal exercises. The cause for this gap is hormonal softening of the tissue, and the stretching of muscle during pregnancy. Left uncorrected, the back is left less supported. Many of the functions of the abdominal muscles directly affect back care:

- Help control the angle of the pelvis and the stability of the low back. The “inner core” muscles are: the pelvic floor, transversus abdominis, multifidus, the diaphragm and posterior fibres of the psoas. The “outer core” muscles also contribute (quadratus lumborum, erector spinae, rectus femoris, gluteals, adductors, hamstrings, obliques)
- Flex the trunk to one side
- Raise the trunk upwards from a back-lying position – getting up from your bed
- Brace the body when it is under stress – lifting (baby), straining or attack

The abdominal muscles are usually the weakest muscles as barely used when sitting, standing or walking at a normal pace. This weakness is the most common cause of back ache which explains the importance of specific exercises as they are only engaged properly with resistance such as leverage of legs, arms and body weight. During pregnancy, abdominal muscles need to be in good shape to accommodate the increasing front load which stresses the spine. A massage practitioner can guide the Mother into the correct pelvic tilt which holds the spine in neutral to prevent poor posture, muscle strain and back ache.

The greatest strain and stress on the body including the abdominals is post birth. During pregnancy these muscles feel fit as they are stretched over the uterus keeping them taut and responsive. However, after the birth they stay the same size but are not providing adequate support for the pelvis and spine. They gradually tighten back to their original state alongside the uterus. But getting abdominals back to their former glory requires active input ideally within 24 hours of birth. Initially it is possible to coax them back to their shortened state without movement until the pelvic floor and abdominal wall have recovered.

None of my case studies mentioned medical input from their monthly antenatal trips about back pain, abdominal and pelvic floor exercises. This could be because they did not initiate the conversation assuming that some back pain was part and parcel of being pregnant. I know the information is readily available having researched the NHS web site but perhaps only on demand. How many first time Mothers think to ask? Another important question is- how many Mothers would be confident (and wisely so) to carry out the abdominal exercises recommended unsupervised? This is where a one-to-one session with a qualified massage practitioner who has specialised in pregnancy is hugely beneficial.

Massage plays another vital role of relaxation for a healthy and active Mother. Recuperation only happens when your heart beats at half its maximum rate and is important for fitness. Muscle tissue breaks down during strenuous exercise and growth takes place during rest which is why athletes are encouraged to take a rest break from training the week before a competition. Muscle tension can become second nature for busy Mothers affecting their posture and causing pain. Intervention will reverse the detrimental effects.

Shiatsu massage is a type of massage that uses hand pressure and movement to adjust the body's physical structure as well as its natural inner energies to help prevent illness and encourage good health. Shiatsu is a Japanese word meaning "finger pressure". It is the latest name for one of the oldest forms of medicine – healing with hands. Everybody can heal with the power of touch. It was developed in the early 1900s by a Japanese man called Tami Tamaki who incorporated the Western medical knowledge of anatomy and physiology into many older methods of treatment. So this type of massage may be referred to as an "alternative treatment", but it is in fact based on fact – the human body and its physiology. The private nature of a treatment does make it exclusive to those who can afford to invest in it unlike the medical antenatal care. In the Oriental tradition, everything vibrates with an energy or vital universal force called *Ki* by the Japanese or *Chi* by the Chinese. Harmony of ki within the human body is essential to health.

Let us clarify ki. A common headache in western medicine may be treated with aspirin and be the result of too poor hydration, stress or tension. In Chinese medicine, the pain is seen as an obstruction of ki which is related to the overall energy patterns in the whole body of that person, their circumstances and lifestyle. Treatment might include work with their arms or legs as well as or instead of their head and will bring more lasting and positive changes to block the superficial symptoms. The importance of using energy work during pregnancy is the fact two people are receiving the treatment and both are going through huge physical changes. This is where shiatsu has a special role in the world of touch therapies, as it encourages the Mother to connect with her baby as well as the father with advice on ways he can help to relieve pain with massage and exercise support.

The basic principle of energy is creating a steady inner flow throughout the body without interruption. Most people have stagnant areas or those overflowing with energy. These two unhealthy expressions of energy are called *kyo* and *jitsu*. *Kyo* is where energy is depleted and *jitsu* is excessive energy. Usually a treatment addresses the *kyo* first by holding the area with long, slow, soft strokes which takes time to reach deep inside the body to strengthen and normalise. This may automatically change the *jitsu* areas before treating them which shows how every part of the body is interconnected. Two hands are used for this work with one supporting the body and the other being active to promote balance. For relaxation and connection to the baby, one hand is placed on the abdomen and the other on the lower back. Pressure is applied by drawing the hands together as the

Mother breathes out in a sensitive and gradual way. Another technique which almost always sent my case studies to sleep was the holding hand placed on the sacrum and the other above the head. By gently moving the hand down the spine from the occiput at the base of the skull slowly towards the other hand at the sacrum, the body relaxes deeply into the healing power of the touch. There are many calming shiatsu points on the body which have the same relaxation affect such as: Kidney 1 below the centre of the ball of the foot, and Heart Protector 8 in the centre of the hand.

To conclude this project, exercise is key in my mind to keeping a Mother fit and healthy during pregnancy and after the birth. It combats the many physical and hormonal changes that are happening by relieving back ache, groin pain, and improving posture with specific pelvic and abdominal exercises. Even for an elite athlete who trains hard there are only a few precautions to take: avoid sports with the risk of falls, trauma or abdominal injury, no overexertion, the right fluid intake and nutrition. Pregnancy massage does play a role in maintaining fitness by keeping muscles healthy, flexible and at the correct length. For Mother's who enjoy sport for leisure it can relieve aches and pains. It is not essential to a Mother's wellbeing. For first time Mothers it gives them a place to relax, connect with their baby, learn correct breathing techniques, embrace the changes in their bodies and give them and their partner tools to treat labour pain. Medical intervention provides security for some – the nuts and bolts of pregnancy and child birth with routine tests and scans. These tests can detect complications and prevent the consequences. Fortunately nowadays, Mothers have the choice to choose the type of labour experience they want and a combination of the holistic and medical input seems ideal.

Bibliography

Noble. Elizabeth	Essential Exercise for the Childbearing Year
Kitzinger. Sheila	The New Pregnancy and Childbirth
Tortora. Gerard	Introduction to the Human Body
Abrahams. Peter	The Atlas of the Human Body
Yates, Suzanne	Pregnancy and Childbirth

Reference Web sites:

1. www.nationalgeographic.com – Why Pregnant Women do not tip over
2. www.betterhealth.vic.gov.au – Pregnancy and Sport
3. www.life.familyeducation.com – Specific Sports Guidelines for Pregnancy
4. www.rcog.org.uk – Exercise in Pregnancy (Royal College of Obstetricians and Gynaecologists)
5. www.telegraph.co.uk/health - ‘The Athlete in me doesn’t like being pregnant’
6. www.royalberkshire.nhs.uk – Caring for your body in pregnancy, Bad Backs: pregnancy and labour
7. www.nhs.uk – The pregnancy care planner – High blood pressure and pre-eclampsia. Deep vein thrombosis
8. www.shiatusociety.org – About Shiatsu
9. www.soniamoriceau.org – The art of witnessing through touch and breath
10. www.engenderhealth.org – Promoting safe motherhood through simple, life-saving interventions (in the developing world)
11. www.freelibrary.com – Perception of the people about Modern and Traditional Health System

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Other References

Case Studies

NCT Handouts – Pelvic Floor and Positions for labour and birth