Pregnancy: The Pre & Post-Natal Postural Effects

By David McGill BSc (Hons)

Certain postural muscles exist within the human body, known collectively as ‘tonic’ muscles. They are designed to subconsciously contract, helping to keep us upright, aligned and balanced during static or dynamic activities such as standing, walking, running or lunging. These ‘tonic’ muscles include the lower back, thighs, chest and upper shoulders. By subconsciously contracting for prolonged periods each day, they often become tighter than other muscles. As muscles work in pairs, this will gradually lead to a difference in muscle length and tension causing some to tighten and shorten and others to lengthen and weaken. Muscles attach to bones therefore this can have an unfavourable, knock-on effect on postural alignment, joint stability and physical functioning.

To maintain postural alignment, balance, and to support the growing weight of the baby, these ‘tonic’ postural muscles work much harder in a pregnant woman’s body. These will tighten to a greater extent, weakening and prohibiting other important muscles from essentially aligning limbs or stabilising joints correctly during body movement. A woman’s posture will therefore alter considerably with each pre-natal trimester period as her baby grows in size and weight.

Postural Changes

1) Higher up the body sees a rounding and elevation/hunching of the shoulders caused by an increased convex curvature of the thoracic spine where the shoulders, arms and ribs are positioned. This is a knock-on effect caused by the forward hip/pelvic tilt lower down the body. This increased upper spine curvature weakens the muscles at the rear of the shoulders and between the shoulder-blades. These muscles are responsible for stabilizing and protecting the shoulder joint and correctly aligning the upper to mid section of the spine. This position of the shoulders will also cause the head to protract/push forward, inevitably leading to muscle tension, pain and movement restriction in the neck and shoulders. Tension in the neck can also restrict blood flow to the brain, causing headaches.

2) The increasing size and weight of the foetus causes an exaggerated forward hip/pelvic tilt, affecting the woman’s centre of gravity and balance. This results in an increased concave curvature of the lower spine as the lower back works harder to hold her upright. This will cause shortening and tightening of the surrounding lower back muscles which restricts movement and places pressure on the nerves and bones of the lower spine, leading to discomfort felt around this area. The forward hip tilt and tight lower back muscles will also cause lengthening and weakening of the abdominal muscles which are responsible for alignment of the hips/pelvis and protection of the spine. Problems with pelvic/hip alignment will have a negative, ‘knock-on kinetic chain’ reaction effect on other parts of the body.

3) Lower down the body, the forward hip/pelvic tilt causes a weakening of the hip, bottom and shin muscles. This results in the twisting inwards/ internal rotation (AKA valgus deformity – see diagram on next page) of the hip/ thigh bones. Inability of these muscles to fully activate and align the hips and lower limbs will place excessive stress upon the hip, knee and ankle joints during static posture such as standing, and dynamic postural movements such as walking, squatting, running or lunging.
These problems can affect a woman in the later stages of pregnancy and post-natally, both short and long-term if they are not correctly rectified. Such postural alterations can lead to a variety of inhibitory, degenerative problems. These include headaches, pain, discomfort, wear and tear and movement restriction in joints such as the neck, shoulders, lower back, hips, knees and ankles during general daily activities and exercise.

Relaxin and progesterone are two hormones released by the female body during pregnancy. These cause joint laxity to allow safe passage and (supposed) ease of delivery of the baby. These hormones remain in the body for up to one year post-birth. Joints that are unstable due to tissue laxity and weakness of surrounding muscles can seriously increase the risk of injury.

Muscles in the body are designed to work in pairs, such as the lower back and stomach. To ensure correct body posture and functioning, there should be equal length, strength and tension in both muscles. If one tightens considerably, its opposite will lengthen and weaken, becoming passive and dormant. As muscles attach to bones, increased tightness and tension in one will cause weakness and lengthening of the opposite muscle, affecting the alignment and positioning of the bones to which these muscles attach. This in turn creates postural instability, increasing the workload on other muscles which otherwise have to compensate for the weakened, passive dormant ones.

Muscles are also meant to contract/activate in specific sequences or patterns to provide optimal body function. These patterns often become corrupted by the postural changes associated with pregnancy, further worsened by unsuitable pre or post-natal exercise, or lack of effort to correct and reverse the unfavourable postural, musculoskeletal and biomechanical effects of pregnancy.

The prime focus of a post-natal exercise programme should therefore be to selectively strengthen muscles which stabilise and align joints, (such as the bottom and hips which are commonly dormant in post-natal women) and selectively massage and stretch over-tightened muscles which will otherwise prohibit joints and limbs from moving freely with correct postural alignment.

Not every pregnant or post-natal lady is the same. Theoretically speaking, they all go through the same process, however the nature and extremity of pre and post-natal postural misalignment can vary, particularly with sideways and/or forwards tilting and misalignment of the hips/pelvis. This will be exacerbated by their pre-pregnancy posture, physical condition and the weight and positioning of the baby/ies during the pre-natal phase.

How do I alter the postural/muscular changes caused by pregnancy?

Most pre/post-natal joint and muscle pain is due to misalignment of the bones and muscles. The tyres of a car will wear unevenly if they are not correctly fitted/aligned and balanced. Likewise, the joints and muscles of the body will become painful if they are in the wrong position at the wrong time. A pre or post-natal woman’s body will compensate for this by changing the position of the adjacent bones and muscle groups. This compensation itself often causes further symptoms, problems and pain, and must be correctly rectified to prevent this worsening in the short and long-term.

Many exercises commonly prescribed in gyms by trainers or instructors are suitable for most people. The problem is that they are all too often prescribed for the person at the wrong time causing other muscles to compensate for weaknesses elsewhere, or joints to suffer for lack of muscle flexibility. Muscles can also be prohibited from functioning by their over-tightened counterparts and will continue to be so in the post-natal body unless these are selectively stretched.

Rather than focusing solely on weight reduction and tone, a post-natal woman should think particularly about correct body alignment and functioning. A post-natal lady can be happy with her body weight, yet be in considerable pain and discomfort, unable to resume exercise due to postural misalignments and problems caused in her body movement and physical functioning.

In addition, post-natal exercise shouldn’t focus solely upon strengthening the core and pelvic floor. After all, why strengthen the stomach if the hips remain misaligned? The stomach and bottom muscles are designed to work together in stabilising and aligning the spine. We shouldn’t work one yet not the other. Weak bottom and hip muscles will be compensated for by the over-activation of the lower back muscles. This will result in lower back discomfort, misalignment of the lower limbs and subsequent pain felt in the hips, knees and ankles, regardless of how many stomach strengthening exercises are performed.

It is essential to make the post-natal woman posturally correct and biomechanically sound by ensuring her fundamental hip and spinal alignment, and muscle functioning biomechanics are ‘normalised’ or correctly positioned using selective, corrective strength and stretching exercises. By doing so, this will provide the building blocks for normal movement. This phase is known as ‘before the core’ as
Post-natal women typically start their exercise programmes with core stability type exercises for which their body is not ready, due to the hip and lower back misalignments.

Over-tightened muscles such as the thighs and lower back which attach to the hips will continue to cause hip and lower back misalignment and subsequent lower stomach protrusion, regardless of how many stomach/core strengthening exercises are performed. This explains why Pilates helps some people and hurts others. We wouldn’t want to stabilise someone in a biomechanically incorrect position otherwise we would be training the person to compensate for her biomechanical problems rather than training her body to perform correct movement patterns with correct postural alignment.

Postural misalignment (common through pregnancy) known as Lumbar Lordosis and Thoracic Kyphosis can affect men, as well as women regardless of whether they are pre-post natal. The diagram below shows how the forward tilting of hips/pelvis affects the concave curvature of the spine and appearance of the body by causing considerable protrusion of the lower stomach. Many post-natal women often mistake this stomach protrusion for excess weight gain, working hard with diet or aerobic exercise, yet see no difference in their stomach shape and tone.

Thoracic Kyphosis occurs in pregnancy causing a forward protrusion of the head and shoulders and convex curvature of the upper spine. This can be easily rectified using corrective exercise, massage and manipulation, otherwise easily exacerbated by conventional exercises such as sit-ups, press ups and lat pulldowns. Some pre-post natal women also develop Scoliotic posture where a sideways curvature of the spine occurs. This requires selective stretching, strengthening, massage and manipulation to correctly rectify.

‘Functional strength training’ is a phrase commonly used these days by trainers in the fitness industry. Unfortunately, it is also subject to misinterpretation. Functional training is fine, but unless you are correcting a post-natal lady’s biomechanical and postural problems first, that lady is only learning faulty movement patterns to compensate for her biomechanical issues which will inevitably lead to further problems. Many fitness professionals are quick to prescribe complex, ‘functional’ exercises such as lunges or cable wood-chops, involving a broad range of muscles. Having failed to selectively stretch tight postural muscles and gradually re-integrate over-stretched, weakened, dormant, muscles back into the role for which they are specifically designed, such exercises greatly exceed the physiological capabilities of the post natal lady, ultimately increasing the possibility of an injury occurring. If a post-natal lady’s biomechanics are incorrect due to muscle tightness, muscle weakness and postural misalignment, her posture and movement patterns during complex, functional exercises such as squats or lunges will be compromised/affected.

Some commonly prescribed strength exercises such as those in Bootcamps or Bodypump can actually overwork already tight muscles. Likewise some flexibility exercises can overstretch already weak, elongated muscles, reducing their ability to contract and function correctly. This will worsen the alignment and physical functioning of the post-natal body, placing stress upon joints and limbs during normal daily activity or exercise, increasing the discomfort felt.
Muscles which commonly tighten from pregnancy | Muscles which commonly weaken from pregnancy
---|---
Chest | Mid/Lower shoulderblades
Upper Shoulders | Rear shoulder stabilizers (rotator cuffs)
Neck muscles | Upper and lower stomach
Latissimus Dorsi/ Lats | Bottom
Lower Back | Outer hips
Thighs | Shin muscles
Hip Flexors | 
Inner Thighs | 
Hamstrings | 
Calf Muscles | 

Post-natal strength, toning and stretching exercises should instead focus on balance and symmetry, left to right, front to back, upper body to lower body, deep and superficial. Exercise prescription should be selective, progressive, and individually tailored to the post-natal woman’s biomechanics, posture and physical capability. This can be ascertained using biomechanical assessments and postural screening. Carried out by a corrective exercise specialist, osteopath or physiotherapist, this involves a detailed, bespoke analysis of your posture. This will identify any misalignments, faulty body movements and tight or weak, inactive muscles. The therapist can then establish which bespoke corrective strength and flexibility exercises are appropriate to start you on. These will help you re-align your posture, ease discomfort, avoid injury and excel with your post-natal exercise with peace of mind.

Commonly Asked Post-Natal Q’s & A’s

How do I rebuild my pelvic floor?

Firstly, correctly align your hips using selective strengthening and stretching exercises. Specific exercises exist for pelvic floor muscles (e.g. hold your pee for 10 secs). These can be performed whilst strengthening hip and stomach muscles. In addition to supporting the intestines, controlling the passing of urine, pelvic floor muscles are designed to work with others (TVA, multifidus, diaphragm), to help stabilise the hips and spine during static and dynamic movement. So, they should eventually be integrated into specific exercises which simultaneously work all of these muscles.

How do I lift the kids without the back aching?

Key muscles exist which are purposely intended for use by the body in ‘bend-to-extend’ movements such as squatting down to pick up your child then standing tall whilst holding them. Such muscles (bottom & mid-shoulderblades) switch off/become dormant through pregnancy. This will remain so if unaddressed post-natally. Subsequently, other muscles designed to partly assist these muscles (lower back, upper shoulders, hamstrings) will have to work much harder, compensating, tightening and causing discomfort during ‘bend-to-extend’ movements. The solution is to isolatively strengthen these weakened, dormant muscles using corrective exercises, and selectively stretch/ massage tight, over-worked muscles. Efforts to strengthen the weakened, dormant bottom/buttock muscles using advanced ‘whole body’ exercises such as squats or lunges will further activate and tighten the muscles already shortened and fatigued from compensating for the dormant inactive muscles, in turn worsening the problem. Such exercises should be temporarily excluded from workouts, instead opting for isolative, corrective exercise to help reactivate important weakened, dormant muscles which the body is heavily reliant upon to perform movements such as picking up your child.

How do I know what exercise is safe or not?

Many exercise professionals are well educated on how to teach exercises, however many are not well-versed in how to calculate when to prescribe the right exercises relative to the client’s bespoke biomechanical and postural needs. Consult someone suitably qualified in rehabilitative exercise prescription such as a corrective exercise therapist or physiotherapist for a biomechanical and postural assessment. They will test muscles to see which are over active and which are dormant/underactive. They will also assess your posture to identify any misalignments, prescribing selective stretches and strengthening exercises to address and rectify this. Everyone can participate in Bodypump and other such classes. The question is whether the right muscles are correctly activating or whether the wrong muscles are over-activating by compensating. Adopting incorrect postures as to adapt to movement restrictions caused by tight muscles and postural misalignments can cause pain, discomfort and worsen someone’s physical condition.
How do I get rid of my belly? Should I consider surgery?

Is surgery really necessary? With the safe weight loss of 2lbs/1kg per week from regular exercise application (such as walking), the realignment of the hips and back using selective stretching and specific corrective strengthening exercises to effectively target the surrounding muscles, a post-natal lady can reverse the pelvic tilt and subsequent lower tummy protrusion. Difficulty in targeting and toning the lower tummy following caesarians can often be due to the prolonged forward tilting of the hips/pelvis causing lengthening and weakness in the lower stomach region and difficulty in activating such dormant muscles.

![Pre-Liposuction Surgery](image1.png) ![Post-Liposuction Surgery](image2.png)

**Note:** Despite abdominal fat reduction, the forward tilting hips and excessive arching/concave curvature/misalignment of the lower back remains. Weakness and lack of tone in the lower stomach and bottom muscles also remains. This will affect lower limb alignment, causing discomfort to be felt in the hips, knees and lower back by muscles over-activating and compensating for those which aren’t functioning correctly.

![Post-natal posture (pre-corrective exercise)](image3.png) ![Post-natal posture (following corrective exercise)](image4.png)

**Note:** neutral posture, correctly aligned hips, flat, strong, toned upper and lower stomach, correct lower back curvature, strong, toned bottom muscles. Stable hips and correctly aligned upper and lower limbs
What will happen if I don’t address or correctly rectify these using selective corrective exercises?

Most joint and muscle pain is due to misalignment of the bones and muscles. The tyres of a car will wear unevenly if they are not correctly fitted/aligned and balanced. Likewise, the joints and muscles of the body will become painful if they are in the wrong position at the wrong time. Your body will compensate for this by changing the position of the adjacent bones and muscle groups. This compensation itself often causes further symptoms, problems and pain.

Problems arise when post natal women don’t get their problems fixed/correctly treated using the right therapy and exercise. The longer these are left, the more they will worsen, becoming harder for therapists to treat. Impairments in posture and movement are the basis of many neuromusculoskeletal pain syndromes, in muscle, joints and their surrounding tissues.

Following pregnancy, many women resume activities such as running, or participate in exercise classes such as Bootcamps or Bodypump. Whilst participating in the exercise activity, it won’t necessarily mean that the right muscles will be functioning. Though often prescribed and eagerly pursued post-natally, certain exercises (e.g. running, lunging, squatting, press-ups) aren’t advisable for many ladies due to these post-natal postural changes. Regardless of time and application, they will remain unless selective stretches and corrective exercises are used to rectify these misalignments, reactivate and strengthen weakened dormant muscles essential for correct body function and alignment during complex body movements/exercises.

At Bodyrefine, we offer a range of services.

These include Corrective Exercise Therapy, Postural Analysis & Realignment, Pre & Post-Natal Deep Tissue Massage Therapy and Personal Training.

All help to relieve pregnancy-induced muscle tension and discomfort, realigning the tissues, improving posture and general body functioning.

To book an appointment or contact Bodyrefine with any questions you may have, either email david.mcgill@bodyrefine.co.uk or call 07748 778515.

For a greater insight into our approach and the services we offer, visit www.bodyrefine.co.uk

Appointments available at Carmenta Life, Berkhamsted from November 2013