Pilates During Pregnancy

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Abstract

The female foregoes extreme physical and psychological changes during pregnancy as intense pressure is placed on the body. It is vital to understand changes that take place during pregnancy to construct a safe Pilates programme whilst selecting appropriate repertoire for each individual depending on their stage of the pregnancy and their particular body to re-establish a healthy body and mind.

Pregnancy is divided into three trimesters, physical changes associated with each trimester will be discussed to understand the limitations of the female body as pregnancy progresses. Examining and addressing how essential correct postural alignment is during and after pregnancy thus avoiding pain and discomfort on the body. A case study is presented to illustrate a class tailored for 20 weeks pregnant Charlotte. G using the BASI block system and repertoire.
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Anatomical Description

During pregnancy the musculoskeletal system, joints, ligaments and organs are stretched and pushed to their maximum especially in the pelvic and lumber spine region. Diastasis recti will occur as a result of the fetus expanding where the rectus abdominus muscles and connective tissue (linea alba) separate (See Fig. 1, Diagrams 2 & 3). With all these physical changes the woman’s centre of gravity shifts causing postural deviations. Maintaining good posture during and after pregnancy is vital for releasing muscle tension, reducing strains on joints, ligaments and muscles as well as improving blood supply around the body. It will enable the autonomic nervous system to function efficiently, which in turn improves the reproductive organs.

The pelvic floor is responsible for maintaining urinary continence, supporting internal organs and sustaining the functioning of the reproductive system. The expanding uterus places a large amount of weight on the pelvic floor and immense stretching at childbirth weakens the muscles. Exercises for the pelvic floor (see Fig.3) improves strength, helps prevent urinary stress incontinence, misalignment in the hips and sacroiliac joint, pelvic organ prolapse and muscle spasms that cause pain in the pelvic area.

The change in the psychological state must also be taken into consideration as the woman adjusts to a new body shape whilst hormonal changes and energy levels all have their affect on mental wellbeing. The Pilates philosophy nourishes both the body and the mind. It requires intense concentration designed to move consciously in perfect alignment, which acts like a form of meditation, clearing the mind as one focuses purely on the precision of movement.
**Trimesters**

**1st Trimester** (0 - 13 weeks): hormone levels change as oestrogen, progesterone and relaxin are released into the body, nourishing the fetus along with loosening ligaments, muscles and connective tissue between the bones for the pelvis to soften and the uterus to expand. Although the body will experience greater mobility and flexibility this can lead to unstable joints, therefore the range of movement must be limited to prevent weakening and damage.

The effects of the relaxin hormone is most concentrated around the pelvis relaxing the muscles, joints and ligaments making room for the growing fetus, which is responsible for destabilising the pelvis that can cause sciatic pain. Strengthening the hip flexors and extensors will aid balancing the pelvis and relieve pressure.

The surge of hormonal change can cause fatigue, dizziness and nausea so only light stretching is advised, avoiding strenuous exercises and any inversions e.g. short spine, jackknife and the tower. Focus should be placed more on postural improvement, strengthening the pelvic floor, breathing and relaxation.

**2nd Trimester** (14 - 27 weeks): as the body settles, both the fatigue and nausea usually disappear leaving the mother feeling physically and emotionally healthier. It is important to find exercises to protect and strengthen the body as the weight of the baby becomes heavier. Working on postural alignment in an upright position where a neutral pelvis is established will reinforce muscles around the lumbar, thoracic and cervical spine as the uterus and breasts develop. Avoid exercises where the abdominals are
strongly contracted to prevent the rectus abdominus spreading further apart e.g. exclude: Hundreds, roll – up, single and double leg stretch.

3rd Trimester (28 - 40 weeks): The body will feel the burden of this extra weight in the uterus and breasts, creating postural imbalances and deviations that can be highly uncomfortable and destabilise balance. As the baby increases in size the pelvis can be pressured into an anterior tilt, changing the centre of gravity and natural curve of the spine (lumbarsacral region) promoting hyperlordosis as the body tries to counterbalance (illustrated in Fig 2).

Weight of developing breasts can increase curvature through the thoracic spine (Kyphotic posture). Awareness of postural deviations will help focus what exercises will be most beneficial e.g. working the pelvis back into neutral position, chest opening exercises, strengthening the upper back and promoting scapula stabilisation preventing rounding in the shoulders. Lying in supine will put a lot of pressure on the spine and can compress veins and arteries limiting blood flow and oxygen to the baby (Fig 4. Depicts ligaments and organs as the uterus expands that will place pressure on the spine). To take this weight off the spine and vital organs exercises should be executed standing, sitting or kneeling on all fours to release tension and strain being placed on the body.
Case study

Charlotte G. is 34 year old, 20 weeks pregnant with her first child and the outward sign of the baby is still very compact. Charlotte sustained a long professional career as a dancer and as a result maintains a naturally fit and very able body. She has no pre-existing injuries or any medical problems. During the first trimester she experienced fatigue and mild morning sickness. Her hormones settled during this second trimester but she is suffering from pain in her upper back especially when she has been sitting for too long with hunched shoulders. No lumbar spine discomfort is being experienced but should be monitored.

Charlotte has a basic knowledge of Pilates fundamentals, each week we modified exercises depending on her physical and mental state. The following pages illustrate a class I designed using the BASI block system and repertoire specifically tailored for Charlotte in her second trimester. The desired results are to create a progressive programme which will maintain Charlotte’s all-over muscle tone, correct postural deviations that could lead to discomfort especially in the thoracic region (where she is already experiencing pain) and fortifying muscles around the pelvic region that would facilitate her during childbirth and throughout the pregnancy.
### Warm Up
- Roll down
- Pelvic Curl
- Spine twist Supine

**Mat**

Focusing on breath is a priority during sessions with Charlotte. As she develops I will take out any exercises in supine and spine flexion. Instead I will have Charlotte warming up standing using a ballet barre.

### Footwork
- Parallel Heels
- Parallel Toes
- V- Position Toes
- Open V heels
- Open V Toes
- Calf raises
- Single Leg Heels
- Single Leg Toes

**Wunda Chair**

Footwork on the wunda chair requires strong trunk stabilisation to maintain correct posture and pelvic alignment. It is a great option for pregnant women to have them sitting upright as the baby becomes heavier and more challenging on the body. We can place the chair against a wall allowing her to use the wall for extra stability.

### Abdominal
- Standing Pike

**Wunda Chair**

It is advised not to do inversions but as Charlotte is not suffering from nausea this is a good exercise not to place additional pressure on the abdominals, when diastasis recti is occurring.

Towards the end of the 2nd trimester I would not do any rectus abdominal flexion work but rather incorporate the use of abdominals as stabilisers during other exercises.

### Hip work
- Frog
- Circles down
- Circle up
- Openings

**Reformer OR Cadillac**

Being a dancer Charlotte has a great ROM, to avoid overstretching I concentrated on limiting her ROM and focus more on control and stability.

As her size increases we will avoid her lying in supine. Choosing the side single leg series on the Cadillac, putting a pad under her belly to not put too much strain on to the obliques.

### Spinal Articulation
- Spine Stretch

**Mat**

This exercise does not place excess pressure on the spine or risk compressing veins and arteries. It is currently possible for Charlotte as her baby is very compact. Alternatively when she increases in size we can use the Kneeling Cat stretch on the Cadillac.

### Stretch
- Gluteals, hip flexors

**Ladder Barrel OR Pole**

Fitting everything into an hour session is challenging but if possible I want Charlotte to do two stretches, one for the pelvis and secondly for the thoracic spine.

Opening up the chest is a pleasant feeling for Charlotte whose developing breasts pull her shoulders forward into a Kyphotic posture. I encourage her to stretch lightly but avoid forcing, which can be common with dancers.

### FBI
- Thigh Stretch

**Cadillac**

Whilst challenging trunk stability and abdominal control it is also gives Charlotte a nice hip flexor stretch.
| Arm Work | Arms standing series:  
Chest expansion  
Hug a tree  
Circles up  
Circles down  
Punches  
Biceps | Cadillac | Working in a standing position is comfortable for Charlotte and enables me to see clearly any postural deviation she is experiencing. This particular arm series contains exercises to encourage opening out the chest through the thoracic spine which helping to relieve the pain she is experiencing in her upper back. |
| --- | --- | --- | --- |
| Leg Work | Squats | Cadillac | I designed a class that would not jump around from one machine to the next but complete 2 or 3 blocks on each piece of equipment to avoid loss of balance whilst keeping Charlotte’s mind and body stimulated.  
Squats gave Charlotte the opportunity to work on strengthening her quadriceps & knee stablisation, all key components when balancing out the muscles as the baby increases in size and destabilises the body. |
| Lateral Flexion | Spine Twist | Mat | Requiring a Lateral flexion exercise that would most benefit Charlotte without putting excessive pressure on her spine (as the weight of the baby increases), would be the spine twist. It engages the obliques and back extensors. Usually performed seated on a mat with straight legs but at this stage it is better to get her sitting on a box with her thighs in a V – position. |
| Extension | Cat Stretch | Mat | An excellent exercise to finish the class, where being on all fours distributes her weight evenly & takes the load off the back. This particular exercise allows for that lovely extension through the thoracic spine and flexion into the lumbar spine (both areas that become tighter during pregnancy) at the same time much focus is required on breathing combining the mind - body holistic approach that we aspire to in Pilates. |
Conclusion

Pilates is extremely beneficial for women during pregnancy as it works on strengthening muscles that will protect joints and ligaments, which undergo great stress and strain placed on the body during pregnancy. Pilates provides numerous psychological benefits that can be very advantageous in reducing stress and anxiety during this demanding time as much emphasis is placed on breathing, connecting the mind and the body during exercises.

Constructing a conditioning programme must be specifically designed according to each client, depending on their stage of the pregnancy. Understanding each trimester will help awareness of the pregnant woman’s limitation and determine modifications the teacher will be required to make such as avoiding exercises in prone and supine during the latter part of the pregnancy.

Pilates classes made Charlotte aware of her postural deviation as a result of her pregnancy, using this conditioning program we were able to find exercises to improve and strengthen areas of weakness that has relieved her back discomfort and improved her general well being.
Diagrams

Fig. 1: Diastasis Recti

Fig. 2: Postural Deviations

Fig. 3: Exercising the Pelvic Floor

Fig. 4:
Bibliography


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