Pilates for Joint Hypermobility Syndrome and Symphysis Pubis Dysfunction

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Abstract

The purpose of this paper is to discuss the role of Pilates in the recovery and day to day management of symptoms for a woman with Joint Hypermobility Syndrome and Symphysis Pubis Dysfunction. After learning about these conditions and the considerations that need to be taken into account, the BASI Block System is used to design a conditioning programme to progressively help stabilise and strengthen the body. The results are positive. Though the structural limitations are not easily repairable, the practice of Pilates is not only a great tool to educate both body and mind, but it also helps balance strength in the body, which is in turn conducive to better alignment and management of pain and other symptoms.
# Table of Content

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abstract</td>
<td>2</td>
</tr>
<tr>
<td>Table of Content</td>
<td>3</td>
</tr>
<tr>
<td>Anatomical Description</td>
<td>4</td>
</tr>
<tr>
<td>Medical Conditions Overview</td>
<td>6</td>
</tr>
<tr>
<td>Introduction</td>
<td>8</td>
</tr>
<tr>
<td>Case Study</td>
<td>9</td>
</tr>
<tr>
<td>Conditioning Programme</td>
<td>10</td>
</tr>
<tr>
<td>Conclusion</td>
<td>15</td>
</tr>
<tr>
<td>Works Cited</td>
<td>16</td>
</tr>
</tbody>
</table>
Anatomical Description

Pubic Symphysis

The pubic symphysis is found on the anterior side of the pelvis and is the anterior boundary of the perineum. It is a non-synovial joint, which contains a thick fibrocartilaginous disc between the articular surfaces of the pubic bones (see fig. 1). The disc has neither synovial tissue nor fluid, which is why it is classified as a symphysis, a Greek Term that means ‘growing together’.

Fig 1: Pubic Symphysis is located on the anterior side of the pelvis between the Pubic Bones (img courtesy of Goitz 2018)

The supporting ligaments of the joint are the superior pubic ligament, inferior arcuate ligament, posterior pubic ligament and the anterior pubic ligament. The arcuate ligament provides most of the joint stability, it blends with the disc to attach to the inferior pubic, it is thick and contains both transverse and oblique fibres (see fig. 2).

The pubic symphysis keeps the bones of the pelvis together and ideally steady during activity. It
resists tensile, shearing and compressive forces and is capable of a small amount of movement under physiological conditions in most adults (up to 2 mm shift and 1° rotation). During pregnancy, circulating hormones such as relaxin induce resorption of the symphyseal margins and structural changes in the fibrocartilaginous disc, increasing symphyseal width and mobility.

Fig. 2: Pubic Symphysis and Superior and Inferior pubic ligaments (img courtesy of Medical Dictionary)

In women, the pubic symphysis gap is as wide as 4-5 mm and it widens an extra 2-3 mm during the last trimester of pregnancy. When the gap is equal to or larger than 10mm, it is then said that there is a diastasis or separation of the symphysis pubic.
Medical Conditions Overview

Symphysis Pubis Disfunction

Symphysis Pubis Disfunction (SPD) occurs when the joint becomes lax enough that the pelvic girdle is rendered unstable. The causes of this instability during pregnancy are not only hormonal (relaxin), pregnancy leads to an altered pelvic load, there could be poor posture and insufficient exercise, pelvic joints moving unevenly, the weight or position of the baby and genetic factors that predispose individuals to suffer from it. Symptoms include:

- Pain that radiates to the back, abdomen, groin, perineum and legs. It can me mild or prolonged and feel like burning, shooting, grinding or stabbing.
- Clicking of the lower back, hip joints and sacroiliac joint when changing position.
- Difficulty and possibly pain with hip abduction and adduction.
- Difficulty with weight-bearing activities like walking, using stairs, standing on one leg, turning over on bed, etc.

Hypermobility Syndrome (HMS)

Joint Hypermobility can be described as having the ability to move joints beyond the normal range of movement. It is common in the general population and it is seen specially during childhood, in females and in people of Asian or Afro-Caribbean decent. It has been found to be a genetic trait.
When there is no pain or symptoms associated with it, it is called ‘asymptomatic’, and it is not considered a disorder. On the other hand, some people with hypermobility are prone to dislocations and pain, fatigue and other symptoms. Hypermobility could be a sign of a more serious hereditary condition, although the levels of severity and causation can variate greatly.

These group of conditions are known as Heritable Disorder of Connective Tissue (HDCT). HDCTs are conditions caused by changes to the genes that build our body’s connective tissues and affect its intrinsic toughness. There are more than 200 known HDTCs and many are rare. The most common are Joint Hypermobility Syndrome and Ehlers-Danlos Syndrome.

The severity and variety of symptoms experienced by someone with Hypermobility Syndrome can change from one day to the other and be vastly different even between affected family members. For some people, the associated pain can become widespread and chronic. Because connective tissue is found all over our bodies, symptoms are not isolated to joints. Some of the most common symptoms are:

- Pain and stiffness in the joints and muscles
- Clicking joints and joints that subluxate and/or dislocate with ease
- Slower recovery from injuries, sometimes not complete
- Disturbed proprioception
- Severe fatigue, possibly caused by muscles having to work very hard to stabilise joints
- IBS and gastroparesis
- POTs and other autonomic nervous system disorders.
Introduction

The reported incidence of pregnancy-related pelvic girdle pain, including symphyseal pain varies widely. A generally accepted figure would be of 20% of prevalence of pregnancy related pelvic pain (Vleeming et al. 2008) with one study attributing the presence of specific symphyseal symptoms to 3% and as many as 1 in 5 of affected women continue to have pain for up to 6 months after the pregnancy (Owens et al. 2002).

It is also known that women with joint hypermobility are more likely to experience SPD because of the already lax connective tissue supporting the pelvic joints. Hypermobility increases the likelihood of the joints getting stuck or moving to abnormal positions, resulting in asymmetrical movements causing pelvic girdle pain (PGP) or SPD. When a person with a Hypermobility Disorder experiences SPD or other PGP, the severity of how and to what extent they are already affected by the disorder will likely impact the rate and degree at which they recover.

It has been suggested that Pilates could be a valuable alternative treatment and that although the connective tissue cannot be altered through exercise, strength and stability can be improved, in turn reducing pain and discomfort. The problem at hand is then designing a Pilates conditioning programme to improve symptoms of SPD in a person with Hypermobility Syndrome.
Case Study

Vanessa Salas Castillo is a woman of 35 years of age. She was diagnosed with Joint Hypermobility Syndrome back in 2012 after a succession of injuries and widespread chronic pain that at the moment were affecting several joints. Her Rheumatologist at the time recommended her to exercise daily and strengthen her body so that her muscles could help the joints limit their movement. She specifically prescribed Pilates.

Vanessa gave birth to a little girl back in 2016. Her pregnancy went well with the exception of a couple of dislocated ribs and suffering from Symphysis Pubis Dysfunction from month 5. The latter has improved, but not disappeared. She still suffers daily pain and her pelvis gets out of alignment very often, it painfully separates occasionally.

Earlier this year, she was referred to a Physical Therapist who is specialised in Pelvic Health and Hypermobility. Her PT periodically does manual therapy to put her hips and ribs back in place and also help release some of the muscles and soft tissue. Vanessa now needs a Pilates programme to strengthen the necessary muscles to stabilise her pelvis and support any mobility gained from her muscles relaxing.

At the moment Vanessa has some limitations. She needs to keep hip abduction limited to a small range, her left hip subluxes easily and there is a bulge in her spine between C4 and C5. She has a story of shoulder impingement and sometimes feels pain and tightness even when her shoulders appear to have good mobility.
Conditioning Programme

Assessment

As a consequence of hypermobility, it is difficult for Vanessa to stabilise her joints. Soft tissues and muscles are extremely tight to support those ligaments and tendons that are lax. Her proprioception is poor. The combination of these factors further propitiate the development of muscular imbalances.

Whilst doing the Roll-Down, there is an evident rotation to the left and very little articulation of thoracic and lumbar spine. Flexible in forward bend, lax and weak hamstrings. When standing, is easy to notice hyperextension of knees and Genu Valgum. There is lumbar hyperlordosis, forward head and tight shoulders and pectoral muscles. Rib cage flares out. Hyperlordotic posture. Pelvic Curls are used to inform of hips asymmetry due to SPD on a daily basis.

Objectives and Muscle Focus

The main objective that should be achieved with this student is pelvic stability. We understand that since Vanessa has hypermobility syndrome, not only was she more likely to suffer from SPD, but also, that it might be what is hindering her recovery. We are not able to repair defective collagen or ligaments themselves, but we can focus on her musculature to support the joint and improve function. To achieve our objective of pelvic stability we need to focus on the muscles that belong to the global system responsible for stabilising the pelvis regionally (see fig. 3):

- Transversus Abdominis
- Latissimus Dorsi
- Gluteus Maximus
- Obliques
- Hip Adductors

*Fig. 3: Posterior and Anterior Muscle Slings (image courtesy of The International Academy of Osteopathy, mod)*

We are going to concentrate on symmetry and balance of strength between left and right sides. We know from our assessment and from her evaluation with PT that her left obliques and right gluteals are stronger than their contra-parts on the opposite side.

Focus will be placed first on stabilising and correct muscle recruitment, then on range of motion. Some general goals will be keeping the ribcage closed and down, neutral pelvis and shoulders relaxed. In addition, because of the student’s poor proprioception and hypermobility, correct recruitment of muscles will be key. For that reason is important to start with the fundamentals.

The student will be taking sessions twice a week and will be doing the foundation exercises at home at least another 3 times a week, paired with the Gluteals Side Lying Series. Leg circles are painful at the moment and because of that they are currently being excluded from the routine.
The first 5 sessions will then be dedicated to precise and mindful mat exercises and working on control and precision on the fundamentals. Then we reintroduce apparatus, Cadillac use is encouraged, specifically for footwork and hip work as the angle benefits hips and further challenges pelvic stabilisation. It is also great for self correction of alignment. What follows is a sample of a routine; sometimes two options are given, but we still remain at the same apparatus for two or thee blocks at a time for better flow.

<table>
<thead>
<tr>
<th>BASI Block</th>
<th>Equipment</th>
<th>Exercise</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warm Up</td>
<td>Mat</td>
<td>-Roll Down-</td>
<td>Pelvic curls awaken the mind body connection. Initiate with deep abdominal engagement and pay attention to hips staying even throughout the exercise. An excellent exercise for the obliques, keep range small for Spine Twist Supine and focus on keeping ribs down and connected to the mat. Be sure to keep a neutral pelvis on chest lifts, TA engaged. During Chest Lift with Rotation, we get great oblique work again. Vanessa will get all the great benefits from the fundamental warm up and build strength, as she is doing the fundamentals at home as well.</td>
</tr>
<tr>
<td>Footwork</td>
<td>Cadillac / Reformer</td>
<td>All footwork</td>
<td>Favour Cadillac Footwork. Emphasis on keeping neutral spine.</td>
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<p>| <strong>Abdominal Work</strong> | Reformer / Cadillac | Short Box Series / Mini Roll Ups, Mini Roll Ups with Rotation, Bottom Lift with Roll Up Bar | Alternate between these two. Attention to detail on Short Box Series, even hips and correct muscle activation. These is a great series, because it involves TA, obliques and focuses on pelvic stability. Bottom Lift with Roll Up Bar to challenge not only trunk stability but Latissimus Dorsi. |
| <strong>Hip Work</strong> | Reformer / Cadillac | Frog, Circles Down and Up, Openings / Basic Leg Springs | Small range of motion. Tailbone down and emphasis on pelvic disassociation. Do not do the Single Leg Series, avoid shearing of pelvis. |
| <strong>Spinal Articulation</strong> | Reformer | Bottom Lift, Bottom Lift with Extension | Strengthening hamstrings and adding challenge to basic pelvic curls as well as challenging stabilisation. |
| <strong>Stretches</strong> | Reformer / Pole | Kneeling Lunge / Pole Series | Alternate between these two. Note that the student didn’t start with Standing Lunge as she is too flexible to get any benefit from it. The Pole Series was chosen not only because of Vanessa’s tight shoulders, but also to reeducate and develop her proprioception; to teach good rotation through the waist and emphasise oblique control with Supine twist; to stretch and create more harmony between her obliques with Side Stretch. |
| <strong>FBI</strong> | Cadillac | Side Reach | Side Reach provides an opportunity to work on pelvic stability and oblique control by keeping the opposite hip anchored when leaning back. |</p>
<table>
<thead>
<tr>
<th>Arm Work</th>
<th>Cadillac</th>
<th>Standing Arm Series</th>
<th>The standing series gives Vanessa a chance to work directly on improving her posture. Ribs down to better trunk stability. Chest expansion focuses on engagement of lats.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leg Work</td>
<td>Ankle Weights Box</td>
<td>Gluteals Side Lying Series / Gluteals Kneeling Series</td>
<td>Alternate between these two. They were chosen to address gluteus medius and maximus, as well as hip abductors and adductors. Since they are part of our muscle focus, the student is doing them at home as well, together with the fundamentals.</td>
</tr>
<tr>
<td>Lateral Flexion / Rotation</td>
<td>Reformer / Chair</td>
<td>Mermaid / Side Stretch</td>
<td>Awareness and developing proprioception is key to execute Mermaid correctly. Keep abs in and ribs together.</td>
</tr>
<tr>
<td>Back Extension</td>
<td>Reformer / Chair</td>
<td>Pulling Straps 1 / Swan Basic</td>
<td>Attention to articulation of cervical and thoracic spine. Also shoulder extension on Pulling Straps 1.</td>
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</tbody>
</table>
Conclusion

After studying how to achieve pelvic stability through strengthening and balancing the respective muscles slings, a BASI Pilates conditioning programme was developed to address those specific muscles: Transversus Abdominis, Latissimus Dorsi, Gluteus Maximus, Obliques and Hip Adductors. The fundamentals were retaught, focusing in precision and correct muscle engagement, retraining the mind and body, fostering proprioception. Progressively the exercises complexity increased. There were hindrances, specially when pelvic stability was challenged beyond what the body could handle at the moment. Through constant and dedicated work, following the conditioning programme described, the student has been gaining strength and stability and improving her proprioception. Her pelvic pain is less intense and she is less likely to have her pelvis separate. The student’s postural deviations has diminished, she is more aware and capable to hold neutral spine when standing and during exercise now.

Additionally, Pilates has shown to be a good exercise for hypermobiles as it works on precision and control, a great tool to strengthen specific muscles to support joints and ligaments. It was also found that the BASI Block System helps organising routines, assuring that the whole body is exercised, even when there is a particular focus.
Works Cited


