Pilates for Post Concussion Syndrome

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Abstract

Practicing Pilates can alleviate symptoms of Post Concussion syndrome or PCS. Research shows that exercise can actually help the functionality of the brain in individuals diagnosed with PCS. As well as the function of the brain, Pilates can help improve sadness and depression in those who have PCS because research shows that exercise can improve mood and help ease depression symptoms. Pilates apparatuses allow for someone who suffers from headaches from PCS to work comfortably on flexibility, strength, balance, and proprioception. Exercising comfortably is important for someone who suffers from PCS because there is a fear that one may worsen their symptoms. Pilates can build a safe environment for these individuals so there is no fear of these symptoms worsening.
Table of Contents

Abstract..............................................2

Anatomical Description......................4

Introduction........................................5

Case Study..........................................7

Basi Conditioning Program.................8

Conclusion.........................................11

Works Cited.......................................12
Anatomical Description

The brain floats unattached inside the skull that has ridges and shelf-like areas. The brain is a delicate organ, similar to the consistency of soft butter or slightly set gelatin.

The most vulnerable areas of the brain are the frontal and temporal lobes because of their anatomy and proximity to the skull. The frontal lobe is responsible for executive functioning, planning, organizing, complex thinking, focus and concentration, and emotional self-regulation. The temporal lobe is responsible for auditory processing, short-term memory, and mood regulation (The Science Behind Concussions).

(Johns Hopkins Medicine Health Library)
**Introduction**

Post Concussion Syndrome or PCS is defined by prolonged concussion symptoms after the normal recovery time for individuals who have sustained a concussion or multiple concussions. According the International Classification of Diseases, PCS occurs after a head trauma and includes at least three of the following symptoms: headache, dizziness, fatigue, irritability, difficulty in concentration and performing mental tasks, memory impairment, insomnia, and reduced tolerance to stress, emotional excitement and alcohol. Symptoms of depression or anxiety resulting from loss of self-esteem or fear of permanent brain damage are seen as adding to the original symptoms (Coppel).

In addition, an article published in the International Review of Psychiatry includes PCS symptoms of depression, and anxiety. Although these PCS symptoms often resolve within one month, in some individuals PCS can persist from months to years following injury and may even be permanent and cause disability (Ryan).

The traditional and widely accepted treatment for individuals who have sustained a concussion and/or suffer from PCS is rest and cessation of previous physically activity. Athletes who have received a concussion must stop playing their sport and rest until symptoms have disappeared. However, a new study from researchers at the State University of New York Buffalo showed that exercise assessment and aerobic exercise training may reduce symptoms PCS patients experience during prolonged cognitive working memory tasks such a fatigue and difficulty concentrating (Straus). The researchers believed a controlled exercise protocol would work for PCS patients because it restored the regulatory system that is responsible for maintaining cerebral blood flow, which may become dysfunctional in people with concussions and PCS.
Although this study focuses primarily on aerobic exercise and Pilates is classified as anaerobic exercise, it shows that a low-level exercise regimen can be performed without any fear of worsening symptoms of PCS.

There are several symptoms that are present in individuals suffering from PCS. One symptom that can be present is sadness or depression. This is very prevalent in athletes and extremely active individuals who are no longer able to play their sport or complete their daily exercise routine. I plan on discussing my case of Post Concussion Syndrome through my case study as I have been diagnosed with PCS and was a former collegiate athlete. I have experienced sadness and a degree of depression after not being able to play my sport. Stopping a sport or exercise routine suddenly can immensely affect one’s mood that has relied on it for so long.

A study from the Institute of Psychiatry in Sao Paulo Brazil found that although the effects of regular physical activity on mood have mainly been studied using aerobic exercise, evidence indicates that anaerobic physical activity, such as body building or flexibility training, can also reduce depressive symptoms (Peluso). Because Pilates in an anaerobic exercise it therefore can affect mood in a positive way alleviating symptoms of someone who suffers from PCS.

All of this research is important as it relates to exercise and PCS because it allows patients to exercise without fear of doing more damage to the brain. I can say this firsthand that after one has sustained multiple head injuries there is a fear and anxiety that forms because the thought of sustaining another concussion or slight set back can be very overwhelming and freighting. After talking to my neurologists and reading how light exercise can actually help regulate the brain and alleviate some symptoms of PCS, I gained
more confidence that I can exercise lightly without doing harm to my brain.

I found that Pilates has been absolutely wonderful because I feel like I can achieve most things I need to be physically fit including improved balance within the body, flexibility, strength and proprioception without having fear of damaging my brain further and suffering through more symptoms. Pilates can be an important tool for athletes overcoming PCS because it can give them confidence that they are working out and still maintaining a healthy lifestyle.

**Case Study**

I chose to research and write about Pilates and PCS because I have seen the benefits on Pilates in relationship to my case of PCS. I sustained my first concussion playing soccer in college. I quickly went back to playing soccer before I was completely symptom free, something that is an issue when resting athletes, because most are so eager to get back into their sport. Because of this I was highly susceptible to more concussions. I then sustained two more concussions and was diagnosed with PCS after the concussion symptoms failed to disappear. I wasn't able play my senior year of college because I was still not symptom free and couldn't afford to sustain another concussion.

After I graduated college I sustained two more un-sports related concussions in the past two years because I was so susceptible to them. I am still suffering from symptoms from PCS today. After I couldn’t play soccer anymore I was in search for something else that made me feel as if I was getting a workout and keeping my body healthy as I did when I played soccer. I fell in love with Pilates after I saw the benefits on my body after playing soccer for so many years, and the confidence if gave me after having to quit my sport.
Basi Conditioning Program

Warm up – Roll Down, Pelvic Curl, Spine Twist Supine, Double Leg Stretch, Single leg Stretch, Criss Cross

I have sustained multiple concussions, which has put a lot of strain on my neck, resulting in tremendous neck pain. Because of this, during the warm up and throughout my conditioning program I am always cautious of tension and the position of my neck. I like the Pelvic Curl and Spine Twist Supine because I can keep my neck and shoulders relaxed. I can also modify the Double Leg Stretch and Single Leg Stretch by putting my hands behind my head while I stay in flexion and complete the leg movements. This exercise allows for an isometric hold in the abdominals, which is still achieved without the arm movement.

Footwork – Footwork on the Wunda Chair

The Wunda Chair is a great apparatus for someone who has been diagnosed with PCS because it allows you to sit up tall and work on co-contraction of the back muscles and abdominals, while doing the leg work and keeping the head stationary. This is in contrast to the Reformer Footwork where you’re lying on your back and the head moves back and forward with the carriage, which can be bothersome if I have a headache, the first symptom of PCS.

Hip Work - Cadillac – Basic Leg Springs Series

Similar to the Footwork on the Wunda Chair, the Basic Leg Spring series allows for the head to be still while working on pelvic lumbar stabilization, hip dissociation, hamstring strength, and adductor strength. Achieving all this while keeping the head still to prevent headaches is something that is very hard to accomplish without this apparatus.
Spinal Articulation – Bottom Lift, Bottom Lift with Extension

Bottom Lift and Bottom Lift with extension are a good option for someone with PCS because unlike a lot of Spinal articulation exercises, it limits tension and pressure on the neck and head. Spinal Articulation on the Mat such as Roll Over, Control Balance and Jack Knife can be contradicting for someone who has a neck and/or head injury. Also the motion of rocking back and forth in exercises such a Roll-Like-A-Ball and Seal Puppy can feel bothersome for someone who suffers from headaches. However Spine Stretch could be a good alternative for Spinal Articulation on the Mat instead of Bottom Lift on the Reformer, because there is absolutely no tension on the shoulders, neck or head.

Stretches – Kneeling Lunge

Stretching is very important for someone who has PCS because they are most likely coming off a time of rest from sustaining a concussion. During this time of rest the body can get very tight so stretching to prevent injuries is very crucial. This is especially crucial for athletes wishing to return to their sports. For me it is important to stretch because I have had long stretches of rest, which has made my body, especially hamstrings, very tight. Also after playing soccer for so many years my hip flexors and hamstrings are very tight so the Kneeling Lunge is extremely beneficial.

Full Body Integration Fundamental/Intermediate – Sitting Forward, Side Reach

Some Full Body Integration exercises may be a contradiction for PCS, such as Up Stretch 1 and Elephant because the head is upside down which causes blood flow to the head and could contribute to headaches. Sitting forward allows you to sit up while working in this block and also work on hamstring flexibility. Side Reach is a nice exercise to follow Sitting Forward because it allows for an oblique and shoulder adductor stretch.
Arm Work – Arms Sitting Series

The Arms Sitting Series is a good exercise series because like the other exercises, you are sitting upright which is a comfortable position for the neck and head. Arms sitting series helps to strengthen the Latissimus dorsi, biceps, pectorals, posterior deltoids, and triceps while keeping the head relatively still.

Full Body Integration Intermediate/Advanced – Balance Control Front

After good scapular stabilization and trunk stabilization is achieved Balance Control Front can be performed. But only is scapular stabilization is achieved so that the shoulders do not take on all the work, which can cause tension in the neck.

Leg Work – Leg Press Standing

Leg Press Standing is a good exercise because it helps to work on balance, which could be impaired after sustaining multiple concussions. Again this exercise allows you to stand up tall, a comfortable position for the neck and head.

Lateral Flexion/Rotation – Mermaid

Mermaid is a comfortable exercise to achieve rotation of the spine. Spinal mobility accomplished by the Mermaid can also improve pain in the neck.

Back Extension- Back Extension on the Mat

I like the Back Extension on the Mat because there isn’t any added stretch on the shoulder to possibly get into the neck and it is easy to sequentially move the spine as I extend the back.
Conclusion

This conditioning program will help to build balance within the body, gain flexibility, achieve awareness and connect to the body after long periods of rest. It will also build strength- something that is usually hard to achieve without headaches if you do not utilize a Pilates apparatus. This program as well as being beneficial physically it is also extremely beneficial psychologically. Exercise can improve one’s mood especially those suffering from PCS where sadness and depression is very prevalent. Pilates has not only helped me in these ways but it has given me confidence in myself and confidence that my body can handle exercise without the fear of a set back or developing worse symptoms. After my research and developing a Basi conditioning program it is clear that Pilates can alleviate symptoms of PCS and should be a part of an exercise routine for those diagnosed with the syndrome.
Works Cited


