(Hip)ster Knees: Can hip exercises help knee pain in people with knee osteoarthritis?

Senior Project

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Abstract

The point of this research paper is to give insight on the idea that hip exercises can help with knee pain from osteoarthritis. In this research paper, I will be looking at other articles. I will not be doing my own personal experiment. Multiple articles will be used for this research paper.

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Introduction

Growing up, I have had my fair share of time on the court and field. I started playing basketball and football when I was a kid (before I even got to my teenage years). I even continue to play the sport of basketball now and hope to coach it soon. I also hope to join a team to play on as well. As one may have guessed by now, I love the sport of basketball.

As we all know, sadly, with sports comes the possibility of injuries. Many athletes around the world can probably tell you stories of some injuries they have received from playing sports. I am included among those who have stories of receiving sports injuries. I have had plenty of ankle injuries. I have even had two knee surgeries; one was to repair a 7^{th} grade football injury and one was to repair a 9^{th} grade basketball injury. All in all you can say the surgeries went well, but I have continued to injure/have knee problems! My knees and I have a love/hate relationship now. Sometimes they treat me right, other times they annoy me and even cause me pain. Sometimes I do some research for one reason or another. I think there was a point when I came across something that basically seemed to suggest that engaging in hip exercises can help with knee pain. If I am not mistaken, there seemed to be more than one source that was endorsing this idea.

So, what if I actually took a deeper look into this idea? What if engaging in hip exercises can help people who deal with knee pain? What if this can really help a lot of people overcome the pain (without surgery) that they thought would be there for the rest of their earthly lives?

Something to think about in a situation that may be somewhat like the topic mentioned above (such a broad topic) is that this topic has the potential to be misleading if not handled correctly. What I mean by saying that it has the potential to be misleading if not handled correctly, is that it is very broad. It may sound like a focused topic to some, but if you look deeper you will see how it has the potential to be misleading.

Think about having pain in your head. That pain could be a result of many different things, right? That pain may be from a fever, a migraine, a tumor, a concussion, or maybe even a blow to the head. figuring out the source of the pain could help you choose the right method in fixing the problem. Giving someone fever reducing medicine probably will not be effective in getting rid of that pain if you have a concussion. This same thing may apply to knee pain. Sure, strengthening your helps might help with knee pain, but it may only apply to knee pain coming from a specific source. Knee pain, like the headache example, can come from different sources. You can tear ligaments in your knee, you can have knee osteoarthritis, you can have a break in your kneecap, you might even have post knee surgery pain. Therefore, it might be beneficial for me to narrow down the source of the knee pain. For this study, I will be observing if hip exercises can help with knee pain in people with knee osteoarthritis. I am not saying that hip exercises will not help with knee pain that comes from other problems other than knee osteoarthritis, this study just will not be focusing on those other areas.

Research

First, let us establish what Osteoarthritis actually is and maybe get a better understanding of what we are dealing with.

> "Osteoarthritis (OA) is a chronic localized joint disease and a leading cause of musculoskeletal pain and disability. Osteoarthritis disease process involves the whole joint including cartilage bone ligament and muscle with changes such as joint space narrowing, bony osteophytes and sclerosis on X-ray (1)." (Verma & Agarwal, 2013, p. 2123).

Now that we have established a foundation of what we are working with, let us get into the research.

The first article we will be focusing on is, *The effect of hip abductors strengthening exercise on knee pain and function in people with knee osteoarthritis* (Verma & Agarwal, 2013). This article mentions something that is rather interesting. It basically shows how common osteoarthritis is.

> "Osteoarthritis is the most common disease of joints in adults around the world. About one-third of all adults have radiological signs of osteoarthritis, although clinically significant osteoarthritis of the knee, hand, or hip in only 8.9% of the adult population. Knee osteoarthritis is the most common type (6% of all adults). (Verma & Agarwal, 2013, p. 2123).

The article makes known that 6% of all adults have knee osteoarthritis. This may seem like a relatively small number, but for those people who are dealing with knee pain from this disease, this could be a big help to them. The article also mentions other risk factors.

> "This research is the step put forth for the further progression in this field, to find out the effectiveness of hip abductor muscles strengthening exercises along with the quadriceps exercises, in reducing knee pain and improving the functional

> performance of knee joint in patients with knee osteoarthritis." (Verma & Agarwal, 2013, p. 2124).

As you can see, the purpose of this study was to see if the hip abductor strengthening exercises ALONG with quadricep exercises would help with knee pain and function in a knee with osteoarthritis.

That being said, the results may have been different if they were to study ONLY hip abductor strengthening exercises and how it may affect a knee with osteoarthritis, rather than having quadricep exercises in the equation.

> "Result of this study shows that the hip muscle strengthening along with quadriceps strengthening is effective in decreasing knee pain and improving function in people with knee osteoarthritis. The study therefore concludes that the experimental hypothesis that is the hip muscle strengthening along with quadriceps strengthening is effective in decreasing knee pain and improving function in people with knee osteoarthritis, is accepted." (Verma & Agarwal, 2013, p. 2124).

It seems the authors conclude and accept that hip abductor strengthening exercises ALONG with quadricep exercises would help with knee pain and function in a knee with osteoarthritis. Is it safe to say that hip abductor strengthening exercises help even if people do not do quadricep exercises along with them? I do not believe this article was focused on answering that question. But let us jump further in our research.

The next article we have, *Effect of a Home Program of Hip Abductor Exercises on Knee Joint Loading, Strength, Function, and Pain in People With Knee Osteoarthritis:*

A Clinical Trial. This article seems to focus on something different than the last article we mentioned. Here is what the author suggests the purpose of this study is,

> "Thus, the purpose of our study was to examine the influence of an 8-week home strengthening program for the hip abductor muscles on hip strength and the knee adduction moment in people with medial compartment knee OA. Given the functional importance of the hip abductor muscles, secondary objectives were to determine whether hip abductor strengthening would improve physical function and knee symptoms in this sample of people with knee OA. We hypothesized that, following the exercise program, participants with medial knee OA would demonstrate greater strength of the hip abductor muscles, a reduction in the knee adduction moment during gait, and improved physical functioning and decreased knee pain compared with a matched group of asymptomatic participants." (Sled et al., 2010, 896).

The "purpose" of this study that the author mentioned in the quote that is listed above, seems to be more directly focused on strengthening the hip abductor muscles and the effects of doing so, whereas the previous article mentioned, *The effect of hip abductors strengthening exercise on knee pain and function in people with knee osteoarthritis* (Verma & Agarwal, 2013) did NOT seem to focus on strengthening the hip abductor muscles independently. The reason this can seem to be the case is because the study in *The effect of hip abductors strengthening exercise on knee pain and function in people with knee osteoarthritis* (Verma & Agarwal, 2013) had quadricep exercises to go

alongside the hip abductor strengthening exercises which may affect the results differently than if one was to JUST strengthen the hip abductor muscles.

The result of this study proved that the 8 week hip abductor muscles strengthening program was that it decreased pain (it had other benefits as well) in people with medial knee osteoarthritis,

> "In summary, an 8-week strengthening program for the hip abductor muscles resulted in increased hip muscle strength, reduced knee pain, and improved functional performance on a sit-to-stand task in 40 participants with medial knee OA compared with a control group without knee OA. There was no change in the knee adduction moment with the exercise program. Further research is needed to investigate whether hip abductor strengthening would be an effective intervention for slowing disease progression and protecting against functional decline in people with medial knee OA." (Sled et al., 2010, 903).

Lastly, we have *Does adding hip exercises to quadriceps exercises result in superior outcomes in pain, function and quality of life for people with knee osteoarthritis? A systematic review and meta-analysis* (Hislop et al., 2020). This article seems to be a little similar to the first article mentioned since they both have quadricep exercises in the equation. I think the first article mentioned was actually reviewed in this meta-analysis, which may explain why they seem similar.

> "The aims of this systematic review and meta-analysis were to: (i) determine the effectiveness of adding hip exercises to a quadriceps exercise programme on pain, function and quality of life (QoL) in people with symptomatic KOA and (ii) determine what type of hip exercise (eg, resistance, functional neuromuscular,

> multimodal) has the greatest evidence for improving pain, function and QoL in people with KOA." (Hislop et al., 2020, p. 2).

The conclusion section of this article seems to suggest that adding hip exercises to quadricep training may be encouraged based on the findings,

> "The addition of hip exercises to conventional quadriceps strengthening results in no greater benefit except for walking in the short-term for people with KOA. These effects may be mediated by the type of hip intervention (eg, resistance) and the location of KOA (eg, medial compartment). The addition of resistance hip exercise to quadriceps strengthening has greater benefits for patient-reported outcomes. For those with medial KOA, the addition of hip resistance exercise has greater benefits on patient-reported function. Based on these findings, clinicians are encouraged to prescribe hip exercise in addition to quadriceps for people with KOA, especially in the presence of medial KOA. The effect of hip exercises in addition to quadriceps and higher-intensity hip resistance over the long term needs to be investigated further." (Hislop et al., 2020, p. 8-9).

Conclusion

After looking at some of the things in these articles, it may seem safe to say that hip exercises may help knee osteoarthritis pain. But these articles were a little specific. Two of the article had quadricep training in the equation which could possibly have a different result if the quads were not trained. Also the type of hip exercises used could yield different results, as suggested by the meta-anaylasis review. The location of the knee osteoarthritis may even produce different results.

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