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Hip Osteoarthritis

This research review is to focus on different methods of therapy for osteoarthritis localized in the hip joint. Osteoarthritis is the degradation of cartilage within a joint, resulting in bone-on-bone contact. The three different treatments that will be investigated in this review are: mesenchymal stem cell, glucocorticoid injection, and cycling with educational program.

The first research article by Mardones and colleagues from 2017 looked at the effectiveness of bone marrow-derived mesenchymal stem cell (BM-MSC) infusion on hip pain, stiffness, physical function, and range of motion. The subjects of the research consisted of 10 individuals who have osteoarthritis in one or bilateral hip(s) which was confirmed by radiological imaging evidence. The subjects were greater than 59 years of age experiencing pain (≥ 40, Visual Analog Scale of 100 mm) which was resistant to analgesics, hyaluronic acid, or cortisone injection treatments. Each of the patients had a bone marrow aspiration of 30mL or 60mL (single or bilateral) from the posterior iliac crest. Prior to the BM-MSC injection the joint(s) were not aspirated or injected with any drug in addition to that all anti-inflammatory and pain relief medications were stopped 3-5 days prior. This was a longitudinal cohort study over three years. Measurements of pain, stiffness, physical function, ROM, and x-rays were performed before and after the BM-MSC treatment. Statistical significance ($P \leq 0.05$) was seen in reduction of pain and increase of function.

The second research article by Dorleijn and colleagues, published in 2018, looked at the effectiveness of a glucocorticoid injection. 106 patients (73 female & 33 males) were analyzed, the selection of treatment was a double-blind experiment, 52 being injected with glucocorticoid and the other 54 were injected with a placebo. The average age of the participants was 64 years old. To be eligible for the research the patient needed to be greater than 40 years of age, meet ACR clinical criteria for hip osteoarthritis. Patients were eligible if they had symptoms of disease for 6 months or longer and had moderate to severe hip pain at a level of 3 or greater (0-10) despite taking oral analgesics. Follow up appointments were scheduled for 2-weeks, 4-weeks, 6-weeks, and 12-weeks following the injection. After the 2-week mark when compared to the placebo the glucocorticoid injection showed significance in reduction of pain in the hip at rest. No significance

was seen reduction of hip pain during walking or in WOMAC pain scale. After the 4-week, 6-week, and 12-week mark the glucocorticoid showed significant improvements in pain reduction at both rest and walking in addition to WOMAC pain reduction compared to the placebo injection. No significant difference was seen between the two groups for quality of life.

The last research article by Wainwright and colleagues, published in 2016, looked at the effects of cycling and educational program on hip osteoarthritis. 119 participants were enrolled into the CHAIN program through referral from their general practitioners. This was a six-week cycling and education program. Pre and post measurements were taken for pain and functionality. The tests used to assess functionality and pain were; Oxford, Sit-to-stand, EQ5D-5L utility, EQ5D vas, Pain at rest VAS, and pain on weight bearing VAS. The research shows that the 6-month intervention of cycling and educating the patients showed significant ($p<0.01$) improvement in function and pain reduction. In addition to that the patients reported being more motivated to exercise due to an increase in confidence to perform activities.

Hip osteoarthritis has various treatment routes, some of which are better than others. All three studies showed improvements in reduction of pain and two of the articles (A cycling and education program for the treatment of hip osteoarthritis: a quality improvement study, Mesenchymal stem cell therapy in the treatment of hip osteoarthritis) showed improvements in function. These findings allow patients to seek different options to manage their osteoarthritis prior to having a hip arthroplasty. It's important to discuss with their doctor which treatment is best and most appropriate for their circumstances. Combination of the different research treatments could yield further beneficial results.

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Congenital Muscular Torticollis

Muscular torticollis is a rare condition that causes neck muscles to contract resulting in a tilt of the head. Torticollis can be inherited; the onset is more commonly seen as an infant. This research review will focus on the effectiveness of different treatment options and discuss the best route of intervention.

The first research study focused on congenital muscular torticollis (CMT) in infants and the best route of therapy. The aim was to see the effects of early therapy treatment and if at home, administered by the parent or outpatient therapy, administered by a physical therapist was more beneficial. In the study 50 patients, 16 females and 34 males with a mean age of 10.2 weeks had CMT; the more severe cases (n=23) were prescribed to the outpatient while the less severe (n=27) were prescribed at home therapy. The therapy consisted of stretching, postural control, performing active rotation exercises, and performing environmental adaptations. The results show that outpatient or at home early treatment therapy showed complete recovery to normal neck movement for infants with CMT. There was no statistical difference of superiority of recovery between the two groups however, it's important to acknowledge that the more severe cases were performed in the outpatient setting.

The second research article reviewed what factors and demographics affect the rehabilitation duration in infants with congenital muscular torticollis (CMT). The study consisted of 118 patients (79 males and 39 females) who were diagnosed and received physical therapy for CMT. The demographic factors considered in the study consisted of; sex, side affected, methods of delivery, fetal presentation, age diagnosed, birth weight, gestational age, cervical rotation, difference in cervical side-bending, difference in cervical side-bending, SCM thickness, abnormal/normal ratio. The results of the study show that there was a positive linear relationship between the thickness of the sternocleidomastoid muscle and the abnormal/normal ratio with the duration of the rehabilitation process. Patients who were also born in the breech position had a longer rehabilitation process. Birth weight and age showed a negative correlation with the rehab

duration. The cervical ROM, mass site, sex, gestational age, and delivery method showed no statistical correlational significance with the rehab duration. This concludes that infants with a thicker sternocleidomastoid, lighter birth weight, and had a breech delivery are more likely to have a longer rehabilitation duration.

The third article took a different approach by looking at the outcomes of using an acellular dermal matrix (ADM) after resection of the distal end of the sternocleidomastoid muscle. Acellular dermal matrix is a soft connective tissue graft. The study consisted of 49 subjects who had neglected or recurred congenital muscular torticollis. 18 of the patients were the study group receiving the resection and ADM, the remaining 31 patients just had the resection. The 1-year primary follow up measurements consisted of passive range of motion, head tilt, cosmetic and functional satisfaction, and scarring. The follow up assessment was based on a scoring scale of the 4 parameters, they were summed up for the final score. The results showed that the ADM group was significantly better for improvement in neck motion and overall assessment score. This concludes that patients over 8 years with recurred or neglected congenital muscular torticollis ADM graft is a beneficial option for better early improvements.

Research has shown that Congenital Muscular Torticollis is a highly treatable condition. Early infant treatment has proven to be beneficial for full recovery and should be taken advantage of for early beneficial outcomes however, if neglected or untreated there are still options for improvement.

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