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Sports Related Injuries and Suggested Treatments: A Research Synthesis

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ABSTRACT
In this study, I reviewed scholarly research articles on sports related injuries and selected 19 represented articles to review and analyze. Through analysis I realized that there are typically two types of treatment, noninvasive/nonoperative and invasive/operative. There are other types of treatment such as the use of corticosteroid injections, and dietary suggestions such as sticking to an omega 3 diet and doing yoga (these two are not very popular). Through this review, I learned that physicians mainly treat sports-related injuries based on the patient's age, ability to recover and type of injury.

Keywords: sports related injuries; complementary and alternative treatment; noninvasive/nonoperative; invasive/operative treatment

INTRODUCTION AND METHODS
Sports-related injuries are a very common issue and almost unavoidable esp. for professional athletes and K-12 school students when they are committed to sports. I myself am passionate for sports and participate in my high school varsity swimming team and have passion for other sports such as basketball and table tennis. While participating in swimming practice, I often hear teammates experiencing inflicted pain or even encounter injuries; one very common painful experience is getting a cramp (caused by long periods of exercise). I find this topic extremely intriguing as I have already set this up as my life goal and future career —help athletes recover and being able to go back to play soon. Based on my interest, I did research on sports related injury treatment and recovery. I searched the MEDLINE database and used key words such as sports related injuries, medicine and treatment for sports related injuries, and sports medicine and limited the search to scholarly articles published between 2010 and 2021. There are approximately 258 articles located, rigorous selection/filter was used to filter and choose relevant and representative research articles. Next, articles that are duplicated and have repeated topics were screened. In addition, some articles were located on MEDLINE but I am unable to access the full text, so these articles were not included in this study. Finally, 19 articles were selected and used for this preliminary study. After a thorough review and analysis of the 19 selected articles the following themes were identified.

DATA ANALYSIS AND RESULTS
The way the articles were reviewed and analyzed is this—as the sole author of this research: I reviewed the selected articles and summarized different treatment plans used to treat sports related injuries. Although the selected studies differ in the types of injuries they focused on and their targeted patients, they all share a similar focus, that is, how the injuries were treated. Below are the themes summarized from these research articles.

One of the representative studies on injury treatment is through corticosteroid injections to treat injuries (theme #1). Injectate choices for large joint and bursal injections are performed by physician members of the American Medical Society for Sports Medicine (AMSSM). This survey study (Cushman, Teramoto, Asay, Clements, and McCormick, 2020) inquired physician's demographics, use of corticosteroids and local anesthetics with a specific focus on large joint and bursal injects (shoulders).[1] A large group of 3400 physicians were reached with a 20% response rate. There are a variety of practitioners who participated in the response; some of those participants are in academics field and others in non-academic field and they have specialties in family medicine, Physical Medicine and Rehabilitation (PM&R), and pediatrics. Two of the most commonly used corticosteroids include triamcinolone and methylprednisolone (regardless of joint location). The volume of corticosteroid use was reported based on what they learned in medical school, fellowship and clinical experiences.

The second representative treatment was through use of complementary and alternative medicine for treatment of sports related injuries (theme #2). In addition, there are also application of chiropractic/osteopathic manipulation, and then the acupuncture/electroacupuncture and yoga. This article (Kent, Tanabe, Muthusubramanian, Statuta, & MacKnight, 2020) focuses on complementary and alternative medicine for athletes because professional athletes seek additional advice for a speedy recovery and pain treatment, such as professional athletes like Amare Stoudemire, a former NBA player, Tony Richardson, NFL athlete, and Pittsburgh Steelers player James Farrior.[2] The study used a questionnaire with 2252 active physician members of the American Medical Association of Sports Medicine (AMSSM). The survey inquired complementary and alternative medicine (CAM) prescribed by the participants over the past year and the perceived effectiveness of the CAM. The response rate is 11%, among which the majority of the physicians (88%) prescribed at least one type of CAM this past year. The most commonly prescribed CAM is chiropractic/osteopathic manipulation, and then the acupuncture/electroacupuncture and yoga, and less commonly prescribed are omega-3 fatty acids, riboflavin, and meditation.

The commonly treated pathologies include ligamentous, tendinous and muscle injury, concussion, and low back pain among others. The results show benefits of acupuncture including analgesia, and regulating various physiologic functions, however, long term benefits is lacking. Although "acupuncture provide improvement in pain from knee osteoarthritis, the benefits were not clinically relevant", and yoga appears to show improvements in pain, strengths, mobility, and self-perceived psychological well-being (p. 31).[2]

There are some discussions about operative/invasive versus non-operative/invasive treatment (theme #3), for instance, a survey study conducted by Parisien, Trofa, Gualtieri, Dodson, Li, Levine, and Vosseler (2020) about treatment for Achille's tendon puncture. In this study they discussed what kind of injuries are mainly treated by nonoperative surgeries or operative surgeries.[5] The majority of the respondents agreed with operative management while very few admitted managing acute ruptures nonoperatively. The main consideration, on which to determine operative or nonoperative treatment, is the patients' age and activity level. Another study with the similar focus was conducted by Lee, Lee and Kim (2020).[3] It is a research synthesis study on non-invasive treatment, the acupuncture. Through review of database such as the MEDLINE and considerate selection process the researchers finalized representative studies on this topic. Results show that acupuncture was applied to treat many sports related injuries and is effective in helping relieve short-term pain and recover from dysfunction, as a useful, noninvasive, and conservative modality for managing sports related injuries.

Other invasive treatment includes thermal treatment and one of the representative studies was conducted by Lopez-de-Celis, Hidalgo-Garcia, Perez-Bellmunt, Fanlo-Mazas, Gonzalez-Rueda, Tricas-Moreno, Ortiz, and Rodriguez-Sanz (2020) (Theme #4).[4] The discussions were on using thermal treatment for Achilles' tendon and musculotendinous junction of the gastrocnemius muscle. Different ways that thermal effect was created were compared and discussed to weigh which method create more thermal effect. These methods include low-power resistive protocol, high power capacitive protocol, and high-power resistive protocol, among which the high-power resistive protocol gave the greatest increase in Achilles tendon and musculotendinous junction temperature. The more temperature change in Achille's tendon and musculotendinous junction increase vascular supply and therefore, speed up tendon repair.

Other methods of treating sports related injuries were through rehabilitation method (Ueblacker, Haensel & Mueller-Wohlfahrt, 2016, theme #5).[6] Ueblacker, Haensel and Mueller-Wohlfahrt reviewed treatment of muscle injuries in football and summarized that there is no firm scientific basis for the current treatment. Due to lack of randomized case studies, the current practices are mainly based on empirical medicine. The recommended treatment is PRICE- principle that refers to *Protection, Rest, Ice, Compression, and Elevation*. There are various factors that medical team should consider when assess and treat athletes with injuries. The researchers differentiate direct and indirect injuries. Then it discussed different types of treatment including immobilization/taping, oral medication, injection treatment, treatment of muscle contusion, debate on non-operative treatment versus surgery, physical therapy and rehab, imaging during rehab. Acute treatment should follow PRICE principle, then use early immobilization in early stage and appropriate inject treatment such as "local injection to increase optimum conditions for muscle generation to reduce scarring and to puncture a potential haematoma or seroma" (p. 2336).[6]

Other rehab plans such as sport specific training with increasing intensity has been recommended for recovery. I also happened to view other studies conducted on cultural differences in terms of treating sports related injuries through a study conducted by Yang, Hwang, Kwon, and Lee (2016).[7] It is a survey study on Korean way of treating sports related injuries. Six Korean medicine doctors completed the survey with 166 reported injury cases from 94 Korean male and female national volleyball players. Among those cases, the most common injuries are knee injury, low back, elbow, and ankle injury if ranking from the most frequently injured to less possible injured. The most commonly used treatment methods include acupuncture, the second most commonly used is chuna manual therapy, then the physical therapy, taping, and finally cupping as the least frequently used treatment. In Korean medicine, medications are less frequently used. In addition to acupuncture, physical and exercise therapy were preferred rather than any medications.

CONCLUSIONS

Through review of different methods in treating sports related injuries it is an eye-opening experience. The treatment methods are mainly determined by the type of trainings physicians received during medical school and their clinical training experiences during residency or fellowship. In addition, the treatment is also determined by the age of the patients, the ability level, and the types of injuries experienced. Through these analyses it is found that the main treatments include noninvasive/inoperative treatment, invasive/operative treatment, complementary and alternative treatment, the thermal treatment, and use of Corticosteroid to treat injuries. There are discussions on omega 3 rich dietary, yoga as methods for treatment as well.

AUTHORS

Harry Feng, a 15-year-old, is interested in sports medicine and dermatology. He got a 3rd and 4th place in a team and partner event respectively in 2020-21Science Olympiad. He is part of the science-research group and the STEM program (research on measuring protein in different substances using the Bradford Assay).

REFERENCES

[1] Daniel M Cushman, Masaru Teramoto, Alexandra Asay, Nathan D Clements, and Zachary L McCormick. Corticosteroid and local anesthetic use trends for large joint and bursa injections: Results of a survey of sports medicine physicians. PM & R, 13(9): 962-968, 2020.

[2] Jeremy B Kent, Kawai O Tanabe, Arjun Muthusubramanian, Siobhan M Statuta, and John M MacKnight. Contemporary and alternative medicine prescribing practices among sports medicine providers. Alternative Therapies, 26(5): 28-32, 2020.

[3] Ji-won Lee, Jun-Hwan Lee, and Song-Yi Kim. Use of acupuncture for the treatment of sports-related injuries in athletes: A systematic review of case reports. International Journal of Environmental Research and Public Health, 17: 8226-8251, 2020.

[4] Carlos Lopez-de-Celis, Cesar Hidalgo-Garcia, Albert Perez-Bellmunt, Pablo Fanlo-Mazas, Vanessa Gonzalez-Rueda, Jose Miguel Tricas-Moreno, Sara Ortiz, & Jacobo Rodriguez-Sanz. Thermal and non-thermal effects off capacitive-resistive electric transfer application on the Achilles tendon and musculotendinous junction of the gastrocnemius muscle: A cadaveric study. BMC Musculoskeletal Disorders, 21(46): 1-8, 2020.

[5] Robert L Parisien, David P Trofa, Anthony P Gualtieri, Christopher C Dodson, Xinning Li, William N Levine, and J Turner Vosseller. How do sports medicine and foot and ankle specialists treat acute Achilles tendon ruptures? Foot and Ankle Specilist, 14(2): 114-119, 2020.

[6] Peter Ueblacker, Lutz Haensel, Hans-Wilhelm Mueller-Wohlfahrt. Treatment of muscle injuries in football. Journal of Sports Sciences, 34(24): 2329-2337, 2016.

[7] Changsop Yang, Lee Eunyoung, Eui-Hyoung Hwang, Ojin Kwon, and Jun-Hwan Lee. Management of sport injuries with Korean medicine: A survey of Korean national volleyball team. Evidence-Based Complementary and Alternative Medicine, 1-7, 2016.