Journal of Orthopaedic Experience & Innovation
Clinical, Economic, and Innovative Orthopaedic Experience

Matzkin, MD, Elizabeth. 2024. "'In My Experience…Sex Differences in Common Sports Injuries: Why Are They Important?'" *Journal of Orthopaedic Experience & Innovation* 5 (1). https://doi.org/10.60118/001c.94089.

Editorial

"In My Experience…Sex Differences in Common Sports Injuries: Why Are They Important?"

Elizabeth Matzkin, MD, MD[a]

Keywords: sportssurgery, ACL, ShoulderSurgery, Sex Differences in Orthopaedic Surgery

https://doi.org/10.60118/001c.94089

Journal of Orthopaedic Experience & Innovation

Vol. 5, Issue 1, 2024

The author reviews her experience related to sex differences in sports injuries.

In 2024, we continue to recognize and understand the importance of sex differences as they pertain to optimizing management of our musculoskeletal health. Since the NIH implemented changes to include females and minorities in clinical research in 1993 and new policies to mandate reporting on males and females in 2014, we have seen a significant increase in research investigating sex-based differences. There are basic anatomical differences in males and females (males have greater bone density, muscle mass, and lean muscle mass compared to females) as well as differences with regards to hormones and genetics. Understanding how all these differences effect sports injuries is important for prevention, management and optimizing outcomes.

We know that female athletes have a 6 to 8 times increased risk of ACL injury compared to male athletes, especially when participating in the same sport. Researchers have extensively investigated anatomical differences, hormonal differences, and neuromuscular differences. Neuromuscular factors seem to be the most important reason for the higher rate of ACL injuries in females. Females demonstrate greater valgus collapse of the lower extremity in the coronal plane, poor trunk control, and a tendency to land with the knee in extension - all of which are factors that contribute to the higher rate of ACL injury. The bone anatomy may also play role in ACL injury risk with differences in tibial slope, femoral shape, hip, and pelvic width. Clear data on hormones and the menstrual cycle and how it may or may not correlate with ACL injury risk is still lacking. Females not only have a higher risk of ACL injury, but also a higher risk of re-injury after ACL reconstruction as well as injury on the contralateral ACL. Females also fail to return to sport at the same rate as male athletes after ACL reconstruction. Thoughtfully considering graft type and graft size to ensure a robust graft for rehabilitation in females is paramount to improving outcomes in our female athletes. Individualizing postoperative physical therapy and providing psychological support all play a role in ensuring we can get our female athletes back to sport at the same rate as our male athletes. We will continue to do more research in prevention and management of these injuries in both our male and female athletes. Although we can reconstruct the ACL and get our athletes back to sport, we still fail to prevent the 10-100-fold greater incidence of post-traumatic OA in our ACL injured patients.

Shoulder instability is more common in our younger male athletes. Glenoid morphology can predispose our athletes to instability with females often having smaller glenoid and higher inclination angles. Despite having these anatomical differences and potential increased risk of generalized laxity in females – males have a higher rate of traumatic shoulder instability. Males are 2.6 times more likely to present to the emergency department with a shoulder dislocation. Males also have a higher risk of recurrent

a Elizabeth Matzkin, MD, is Board Certified and fellowship trained Orthopaedic Surgeon specializing in Sports Medicine at Brigham and Women's Hospital. She serves as the Chief of Women's Sports Medicine and her clinical interests are focused on preventing and providing care for sports injuries. She performs minimally invasive arthroscopic knee and shoulder surgery including ACL reconstruction, complex knee ligament reconstruction, meniscus repair, rotator cuff and labral surgery.

Dr. Matzkin is a former team physician for the Duke University Men's Football team and the men's and women's basketball teams and currently serves as a team physician for the U.S. Women's National Soccer Team, U.S. Paralympics Soccer Team, U.S. Women's National Hockey Team, and she is the head team physician of Stonehill College.

Dr. Matzkin works with a collaborative, multidisciplinary team including: physical therapy, endocrinology, nutrition, physical medicine and rehabilitation, and sports psychology. Whether treating a competitive athlete or a recreational athlete, Dr. Matzkin's goals are to return her patients to the activities they love. Dr. Matzkin's research has focused on the female athlete and sex differences in musculoskeletal medicine.

Visit Dr. Matzkin's Website

Connect with Dr. Matzkin on LinkedIn

Conflicts of Interest Statement for Dr. Matzkin

Visit the Open Payments Data Page for Dr. Matzkin

shoulder instability after an initial traumatic dislocation. Both male sex and younger age are independent risk factor for recurrent shoulder instability. As we continue to study shoulder instability, we need to strive to understand how to mitigate this risk in our young male athletes.

Lastly, RED-S stands for relative energy deficiency in sport and was previously referred to as the female athlete triad. RED-S may affect both male and female athletes but is more common in our female athletes. We know that any energy deficiency can lead to abnormal menstrual cycle and a decrease bone density, resulting in a higher risk of bone stress injuries. Most athletes that have struggled with a relative energy deficiency in sport will present to the orthopedic surgeons' office with a stress fracture or bone stress injury. Stress fractures are more common in our female athletes compared to our male counterparts. Femoral neck fractures are 4 times more common in our female runners. When these athletes present to our clinics, it is extremely important to ask the questions regarding their nutritional status and their menstrual cycle. We need to make sure that we address any potential underlying causes to include the most common of which is energy deficiency. This is important because if we can identify and treat these relative energy deficiencies early and avoid any premature osteoporosis, we can potentially prevent fragility fractures later in life. There is also a subset of male endurance athletes that also experience deficits in nutrition, reduction of sex hormones and impaired bone health.

Understanding the sex differences in common sports injuries is crucial for developing targeted injury prevention strategies and optimizing rehabilitation approaches. Factors such as hormonal influences, neuromuscular imbalances, anatomical differences, and sport-specific demands all contribute to the observed disparities. Acknowledging these distinctions can inform coaches, healthcare professionals, and athletes, enabling the implementation of personalized training programs and injury prevention measures to enhance overall athletic performance and well-being.

Submitted: February 10, 2024 EDT, Accepted: February 16, 2024 EDT