Summary:
Among patients who underwent arthroscopic knee or shoulder surgery, a multimodal opioid-sparing postoperative pain management protocol, compared to standard opioid prescribing, significantly reduced postoperative opioid consumption over 6 weeks.

Purpose: To evaluate the impact of a multi-modal, opioid-sparing approach to postoperative pain management compared to the current standard of care in patients undergoing arthroscopic shoulder and knee surgery. Methods: This randomized controlled trial was performed at 3 clinical sites from March 2021 to April 2022. Adult patients undergoing outpatient arthroscopic shoulder or knee surgery were followed to 6 weeks postoperatively. The opioid-sparing group (100 participants randomized) received a prescription of 1) naproxen, acetaminophen and pantoprazole, 2) a limited "rescue prescription" of hydro-morphine, and 3) a patient education infographic. The control group (100 participants randomized) received the current standard of care as per the treating surgeon, which consisted of an opioid analgesic. The primary outcome was postoperative oral morphine equivalent (OME) consumption at 6 weeks postoperatively. There were seven secondary outcomes, including pain at 2 and 6 weeks postoperatively, patient satisfaction at 6 weeks postoperatively, opioid refills at 6 weeks postoperatively, quantity of OMEs prescribed at 6 weeks postoperatively, adverse events at 6 weeks postoperatively and patient reported medication adverse effects at 2 weeks postoperatively. Results: Among the 200 patients who were randomized (mean age, 45; 73 (38%) females), 193 (97%) of patients completed the trial. Of these 193 patients, 98 were randomized to receive the standard of care and 95 received the opioid-sparing protocol. Patients in the opioid-sparing protocol consumed significantly fewer opioids (median 0mg; IQR: 0-8.0) than patients in the control group (median: 40.0; IQR: 7.5-105.0; Z = -6.55, P < .001). Of the 6 prespecified secondary endpoints, 5 showed no significant difference. The mean amount of OMEs prescribed was 341.17mg, 95% CI: 310.2-372.1 in the standard of care group and 40.4mg; 95% CI: 39.6-41.2 in the opioid sparing group (MD 300.8mg; 95% CI: 269.4-332.3; P < .001). There were significantly more patients reported medication-related adverse effects in the standard of care group (32% vs. 19%, P = .048). Conclusion: Among patients who underwent arthroscopic knee or shoulder surgery, a multimodal opioid-sparing postoperative pain management protocol, compared to standard opioid prescribing, significantly reduced postoperative opioid consumption over 6 weeks.

Category: Sports Medicine

Higher Grit Scores are Associated With Greater Scholarly Productivity Among Orthopaedic Surgery Residents

Abstract ID# 22940
All Authors:
Griffith C Gonnell MS UNITED STATES
Ell B. Leviit MD UNITED STATES
Ayoosh Pareek MD UNITED STATES
Christopher L. Camp MD UNITED STATES
Michael J Alaia MD UNITED STATES
Gregory P Guyton M.D. UNITED STATES
Heath Patrick Gould M.D. UNITED STATES

Summary:
Increased grit scores are strongly associated with increased rates of orthopaedic research productivity in United States and Canadian orthopaedic residents. Data:
Grit is defined as trait-level perseverance and the ability to sustain passion for long-term goals. It is strongly associated with resilience, hardness, and mental toughness. Prior studies show grit to be a positive predictive factor for nursing, pharmacy, and medical student performance with increased grit relating to improved clinical performance, decreased burnout rates, and improved residency match rates. To date, no studies have investigated the relationship between grit and scholarly activity in the form of research productivity. Scholarly activity in resident education is a core component of training due to its ability to promote critical thinking and an improved understanding of pathophysiology and treatment modalities. Methods available to predict scholarly activity of orthopaedic residents are currently lacking. Personal characteristics such as grit provide a measurable trait that could be used to measure an applicant’s ability to handle the rigor of orthopaedic residency schedules while also predicting scholarly output. This study measured grit and scholarly productivity using an online survey reviewed by the American Academy of Orthopaedic Surgeons (AAOS) and distributed to AAOS resident members in the United States and Canada. The survey collected demographic data and outcomes such as number of peer-reviewed publications, number of conference presentations, number of lead or first author publications, number of published book chapters contributed to, and number of manuscripts produced. This survey was complemented by the Short-Grit questionnaire, a 12-question validated assessment of grit. The maximum grit score was 5 (extremely gritty) and the minimum score was 1 (not gritty). Cohorts were grouped as high grit (score > 4.0) vs low grit (score < 3.9). Chi-squared tests were used to determine which factors were independently associated with metrics of research productivity. All findings were considered significant at P < 0.05 (two-sided). 399 residents were included in the study from a pool of 4,832 (response rate of 8.3%). The mean grit score was 3.8 ± 0.5 with a range of 1.75 – 5.0. Residents in the high grit score cohort were more likely to have 10+ peer-reviewed publications (P < .001), to have contributed to 10 + presentations (P < .001), and were more likely to be the lead author or first presenter for 7 + projects/publications (P < .001) when compared to residents in the low grit score cohort. Limitations of this study include possible recall bias from survey participants as survey responses relied on self-reporting research activity, and the arbitrary grit thresholds incorporated into the cohort design. These results suggest that a higher grit score is strongly associated with scholarly productivity among orthopaedic surgery residents. Due to the value of resident research and its association with resident engagement within the orthopaedic field, this points to grit as a possible positive predictor of orthopaedic resident performance. This study presents grit as a possible tool that may predict such attributes and act in tandem with typical evaluation methods to create more well-rounded analysis of residents and residency applicants.

Category: Sports Medicine

Do More Platelets in the Peripheral Blood Mean More Growth Factors in Platelet-Rich Plasma?

Abstract ID# 23186
All Authors:
Paweł Reichert Prof POLAND
Maciej Dejnek MD POLAND
Helena Moreira PhD POLAND
Sylwia Placzkowska PhD POLAND
Aleksandra Krolikowska Prof. POLAND

Summary:
The content of platelets and WBC in whole blood strongly correlates with their content in PRP, and thus with a higher content of some of the growth factors: TGF-ß1 (free active), EGF, FGF-basic, VEGF, HGF, PDGF-AA, PDGF-BB. Complete whole blood count analysis before PRP treatment may be helpful in making decision about its used.

Data:
Title Do more platelets in the peripheral blood mean more growth factors in platelet-rich plasma? Background The justification behind platelet-rich plasma (PRP) injections in sports injuries is related to the high content of growth factors released locally from platelets a-granules. These molecules, involved in natural healing processes, are expected to accelerate tissue regeneration and recovery of athletes. The wide range of platelet counts in healthy blood, a variety of preparation protocols, and administration techniques may be among the causes of inconsistent results in PRP treatment. The study aimed to assess the relationship between the content of cellular components in the whole blood and PRP samples and their correlation with the content of growth factors. Material and Methods A blood sample was taken from 43 subjects aged 24 to 60, and PRP was prepared using the Mini GPS III Platelet Concentration System (Biomet Inc., USA). Complete blood count was evaluated in both whole blood and PRP samples. Multiplex bead immunoassays and flow cytometer measurements were used for seven growth factors assessment in PRP: Transforming growth factor-ß1 (TGF-ß1, free active), Epidermal growth factor (EGF), Fibroblast growth factor-basic (FGF-basic), Vascular endothelial growth factor (VEGF), Hepatocyte growth factor (HGF), Platelet-derived growth factor-AA (PDGF-AA), and Platelet-derived growth factor-BB (PDGF-BB). Statistical analysis was performed, searching for correlations between the cellular components of whole blood/PRP and the content of selected growth factors. Results The complete blood count analysis shows a wide range of the content of platelets (PLT 133 – 419 109/L), white blood cells (WBC 4.06 – 9.82 109/L), and red blood cells (RBC 3.93 – 5.82 1012/ L). In PRP, the PLT concentration increased 4.5 times (from 249,67 10^9/L to 1119,81 10^9/L to 1119,81 ±443,07), the WBC concentration increased 4.75 times (from 6,57 ±1,37 to 31,24 ±10,09), the RBC concentration decreased 4 times (from 4.89
There was a significant high correlation between all cellular components in whole blood and in PRP, except RBC. Significant positive Spearman correlations were found between the concentration of PLT in whole blood and the concentration of PDGF-BB in PRP (r = 0.41; p < 0.008) and also between concentration of WBC and VEGF (r = 0.35; p < 0.05), HGF (r = 0.36; p < 0.05) in PRP. Significant positive correlation were also found between the concentration of PLT in PRP and the concentration of EGF (r = 0.59; p = 0.001), PDGF-AA (r = 0.52; p = 0.001), PDGF-BB (r = 0.49; p = 0.001), WBC in PRP and VEGF (r = 0.39; p < 0.05). Significant negative correlations were found between the concentration of RBC in PRP and the concentration of TGF-ß (r = -0.43; p < 0.05), FGF-basic (r = -0.42; p < 0.05). Conclusions The content of platelets and WBC in whole blood strongly correlates with their content in PRP, and thus with a higher content of some of the growth factors. Complete whole blood count analysis before PRP treatment may be helpful in making decision about its used.

Category: Sports Medicine

Athlete SARMs Abuse: A Systematic Review

Abstract ID# 22728
All Authors:
Nikhil Vaiiredi MHA UNITED STATES
Henrik Hahayman BS UNITED STATES
Heath Patrick Guild M.D. UNITED STATES
Andrew Gregory MD UNITED STATES
Elizabeth B. Gauden MD UNITED STATES
Christopher C. Dodson MD UNITED STATES
James E. Voos MD
Jacob Giovanni Calcei MD UNITED STATES

Summary:
Athlete SARMs abuse is rapidly growing, harmful, and understudied.

Data:
Introduction: Selective Androgen Receptor Modulators (SARMs) are small-molecule compounds that exert agonist and antagonist effects on androgen receptors in a tissue-specific fashion. SARMs are not FDA approved in the USA, but are readily available for purchase online. Increasingly, athletes have turned to SARMs in recent years as a means of augmenting lean muscle mass, evidenced by positive tests across multiple athletic organizations including the Olympics, NFL, NBA, UFC, and NCAA. However, the safety of SARMs for anabolic effects has not been established, and case reports associate SARMs with deleterious effects, including drug-induced liver injury, myocarditis, and tendon rupture. The purpose of this novel systematic review is to provide a comprehensive synthesis of the SARMs literature for sports medicine clinicians to understand the clinical effects, treatment protocols, prevalence, and potential contamination associated with athlete-consumed SARMs. Methods: A systematic review of the English-language literature from PubMed, Cochrane, and Embase was performed according to the PRISMA guidelines. Articles relevant to SARMs clinical outcomes, elimination profiles, contamination, safety profiles, prevalence, and doping control were included. Reviews, meta-analyses, editorials, and conference abstracts were excluded. Ostarine (Enobosarm, GTX-024, MK-2886, S-22), Ligan-drol (LGD-4033, VKS211), RAD-140 (Testolone, Voilasarim), and Andarine (S-4, GTx-007) were selected as the primary focus of the systematic review, given the reported widespread recreational abuse of these specific SARM compounds. Data specific to each article type or topic (e.g. clinical study, case report, preclinical model) were extracted, assessed, and presented in tables. The heterogeneity of the study data precluded meta-analyses. Results: The literature search yielded 2012 abstracts, and a total of 72 articles from 2003 to 2022 were identified for inclusion. Notably, four of eight SARMs clinical studies reported significant increases in lean body mass (LBM). Thirteen case reports described 15 cases of SARMs abuse, all published within the last 3 years. All of the described patients were male, the median age was 32 (range, 19 – 52) years, more than half were identified as athletes (8/15), and all ingested SARMs orally for an average course of 8 weeks. Five patients explicitly denied “illicit drug use.” Athletes most commonly purchased SARMs online, and a majority of these compounds are contaminated with other substances. Athletes consumed SARMs at much higher doses than clinically studied, which may increase the risk of associated side effects such as liver injury, impaired insulin sensitivity, cardiovascular events, and tendon damage (perhaps akin to anabolic androgenic steroids in this regard).

Conclusion: Athlete SARMs abuse is substantial yet unsafe, and public health oversight bodies should advocate for regulation of these gray-market compounds. Further basic science and clinical studies are warranted to validate these early reported findings regarding SARMs. The results of this systematic review serve to educate sports medicine clinicians and researchers on how to better identify, diagnose, and treat athlete SARMs abuse.

Category: Sports Medicine

Injury Rates in NCAA Student-Athletes Increased after COVID-19 Lockdown: A Descriptive Epidemiological Study

Abstract ID# 21416
All Authors:
Hunter Suiter Angieller BA UNITED STATES
Samuel I Rosenberg MD UNITED STATES
Joseph E Tanebaum MD, PhD UNITED STATES
Michael Terry MD UNITED STATES
Vehniah K. Tjong MD, FRSCS UNITED STATES

Summary:
This study describes the epidemiology of injuries in collegiate sports at a Division I NCAA varsity institution following the onset of the COVID-19 pandemic. Data: Background: The COVID-19 pandemic altered sports at all levels of play and led to frequent schedule changes, abbreviated seasons, and disrupted training. The unprecedented nature of the COVID-19 pandemic meant that there was no evidence-based strategy to guide a safe return to sport after a prolonged suspension of play. During the season immediately following COVID-19 lockdowns, the National Football League, Major League Baseball, and multiple European soccer leagues reported increased injury rates. However, the effect of COVID-19 precautions on National Collegiate Athletic Association (NCAA) student-athletes’ health and safety remain unknown. The purpose of this retrospective study was to address this gap in the literature by investigating the epidemiology of NCAA injuries during the 2020 season when compared to pre-COVID-19 seasons. It was hypothesized there would be an increase in overall injury rate and an increase in the number of days unavailable during the 2020 season when compared to pre-COVID-19 seasons. Methods: The injury surveillance database at a single NCAA Division I institution was queried for injuries that resulted in time loss for a student-athlete (missed game or practice), or for injuries that persisted longer than 3 days. Injuries were categorized by anatomic area. Days unavailable were recorded as total days that a student-athlete was listed as “out of activity.” Injuries and days unavailable per 1,000 athlete-exposures (AEs) were calculated for the pre-COVID-19 seasons (2017-2020) and the 2020 season. Results: Compared to the 3 pre-COVID-19 seasons, injury incidence per 1,000 AEs increased by 10.5% in the 2020 season (68.4 vs 75.6 per 1,000 AEs). Total days unavailable decreased by 20.7% in the 2020 season (1,374 vs 1,089 days per 1,000 AEs). Compared to female teams, male teams had a larger increase in injury incidence (16.4% vs 6.5%) and larger decrease in days unavailable (23.7% vs 10.75%). Among individual sports, football had the highest injury incidence during the pre-COVID-19 seasons and the 2020 season (180.4 vs 251.0 per 1,000 AEs). Volleyball had the highest increase in injury incidence (123% increase), followed by wrestling (102%). The anatomic distribution of injuries individually varied for each team and there was not a collective trend across sports during the 2020 season. Conclusion: Compared to pre-COVID-19 seasons, the incidence of injuries was higher among collegiate student-athletes at a single NCAA Division I school in the season immediately following the COVID-19 lockdown. Although the incidence of injuries increased, the number of days missed due to injury decreased. The decrease in days unavailable suggests that injury severity of the average reported injury event may have decreased. Importantly, all student-athletes did not experience the same change in injury rates, with some sports disproportionately affected. To our knowledge, this is the first study to describe the epidemiology of injuries in the post-lockdown season for collegiate student-athletes. Understanding the specific risk factors and reasons for the changes in injury characteristics allows for guided resource allocation and improved focus of prevention measures. We recommend that for the safety of student-athletes, increased caution be taken when returning to play after prolonged restrictions on athletics.

Category: Sports Medicine

Effects of Early Sports Specialization on Collegiate Basketball Players: Injury, Career Outcomes, and Gender Differences

Abstract ID# 22298
All Authors:
Rishi Sinha BA UNITED STATES
Caitlin M. Rugg MD, MS UNITED STATES

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