Pain Management in Elite Athletes: A Systematic Review

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Abstract

Pain is common among elite athletes and can be related to sport-related injury. Recent International Olympic Committee (IOC) guidelines provide support for sports medicine physicians in treating pain in elite athletes. This review outlines the pathophysiology of the different types of pain, as well as non-pharmacological and pharmacological strategies to manage pain in elite athletes. This review additionally describes prevalence of use, physician prescribing patterns, and athlete attitudes and experiences with pain management.

Background

Pain is common among elite athletes as it is often associated with sport-related injury. Both pain and injury can interfere with an athlete's performance. Prior to the 2017 IOC Consensus on Pain Management in Elite Athletes, there were no evidence based or consensus-based guidelines regarding pain management in this Population. While management typically involves analgesics, rest, and physical therapy, a more comprehensive treatment strategy needed. Addressing the underlying injury pathophysiology, athlete biomechanical abnormalities, injury related psychosocial issues, and complimentary therapy techniques.

Figures/Tables

Pain pharmacologic management for acute pain with possible same-day return to play	
MILD TO MODERATE PAIN	
Acetaminophen (oral)	Loading dose up to 2g, then 325-1000mg PO q4-6h (up to 4g/24h)
NSAIDs (oral)	Ibuprofen: 400-800mg q4-6h with food (up to 3200mg /24h) Naproxen: 250-500mg BID with food Ketorolac: 10mg q4-6h with food (up to 40mg/24h) Celecoxib: 200-400mg BID Etoricoxib: 90-120mg QD
Topical analgesics	Rubefacients: methyl salicylate, turpentine oil, ammonia water Cooling sensation: camphor, menthol Vasodilation: histamine dihydrochloride, methyl nicotinate Irritation without rubefaction: capsaicin, capsicum oleoresin
MODERATE TO SEVERE PAIN	
NSAIDs (injection)	Ketorolac: 15-30mg IM or IV up to 4x/day, at least 6h apart, or a single 60mg injection

Pharmacologic management for acute severe pain with no same-day return to play	
Intravenous	Morphine (10mg) Fentanyl (100mcg, titrated to effect)
Inhalation	Entonox/Nitronox (inhaled 50:50 oxygen and nitrous oxide mixture) Methoxyflurane/penthrox
Intranasal	Diamorphine (1600mcg) Fentanyl (100mcg via nasal syringe adaptor)

Sports Organization	**Cannabis Regulations**
NCAA	Increased THC testing threshold from 15 to 35ng/mL in 2019
Major League Baseball (MLB)	Removed cannabis from its banned substance list
National Hockey League (NHL)	No penalties for players who test positive for cannabis
National Football League (NFL)	Modified stance on cannabis: players no longer suspended for positive marijuana tests, testing period reduced from four months to two weeks at start of training camp, and increase in the permissible THC levels from 35ng to 150ng
National Basketball Association (NBA)	Cannabis and its other forms are banned. Penalties include fines, counseling, follow-up testing, and game suspension.

Conclusion

NSAIDs are the most commonly used pain medication by elite athletes but must be considered with particular attention to their side effects. There are a myriad strategies that can be used to manage pain in elite athletes, with varying efficacies, and understanding an athlete's experience with pain management in the past and their attitude toward treatment is arguably just as important as the treatment itself.

References

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