

Cardiovascular collapse leading to head impact exposure during weigh-in -highlighting the dangers of extreme weight cutting in MMA

Abstract

Professional mixed martial arts (MMA) is a popular combat sport worldwide. The health dangers of extreme weight cutting such as cardiovascular collapse and increased susceptibility to concussion are increasingly being recognized in this sport. Cardiovascular collapse due to an extreme weight cut is mostly likely to occur at the time of the weigh-in. To ensure the health and safety of combatants, there should be adequate medical staffing at the time of the weigh-in.

Keywords: boxing, combat sports, concussion, weight cutting, syncope

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Nitin K Sethi

New York-Presbyterian Hospital, Weill Cornell Medical Center,
New York, NY, USA

Correspondence: Nitin K Sethi, MD, MBBS, FAAN, Associate Professor of Neurology, New York-Presbyterian Hospital, Weill Cornell Medical Center, New York, NY, Chief Medical Officer, New York State Athletic Commission, USA,
Email sethinitinm@hotmail.com

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Introduction

A combatant attempting to make weight experienced sudden cardiovascular collapse with head impact exposure leading to concussion. Ringside physicians and Commission officials should be aware of the dangers of extreme weight cutting. Event medical services for MMA should include presence of adequate emergency medical services (EMS) personnel at the time of the weigh-in physical.

Case report

During a MMA weigh-in physical, a combatant attempting to make weight collapsed. His trainer rushed to call the ringside physicians for help. As the ringside physician entered the hot humid room, he found the combatant collapsed on the floor with his coach besides him. The physician was informed that the combatant weighed 180 lbs on Monday and was attempting to make weight of 155 lbs by Friday. While working out in a rubber suit, he suddenly collapsed striking his head against the carpeted floor. On examination the combatant was unconscious with no palpable radial pulse. His legs were immediately elevated, and the coach was instructed to turn the air conditioning on and fan the unconscious fighter. At this point, a weak pulse was palpable and the combatant regained consciousness. The ringside physician attempted to coax the combatant to take water orally, but he refused saying that he wanted to make weight. The fighter was informed that the fight had been called off on medical grounds, but he still refused water. He finally accepted water when his coach ordered him, muttering "coach, I am sorry for letting you down". Water and apple juice were administered orally. The combatant complained of headache which self-resolved. He denied any other concussion symptoms except cramping. Neurological examination was non-focal. By this time EMS personnel arrived to render assistance. Vitals had stabilized with PR 80/min and BP 120/82 mm Hg. Blood sugar by finger stick was 180 mg/dl. He was advised to go to the emergency department for evaluation which he refused stating that he did not have insurance coverage. Intravenous fluids were administered at the venue and the fighter was discharged to the care of his coach.

Discussion

Cutting weight is a common practice in MMA. Barley et al. in their review on this topic documented that between 60-80% of competitive combat sports athletes from varied sports such as MMA, Brazilian jiu jitsu, taekwondo, boxing, judo, Muay Thai and wrestling among others admitted to have engaged in some form of weight cutting. The prevalence of weight cutting though appeared to be greatest in boxing and MMA.¹ The actual extent of the problem is still not known as majority of data on this subject has been collected by self-reported methods which are less accurate than unbiased direct investigator observation.

Extreme weight cutting involves losing large amounts of weight in a short period of time using techniques such as sauna, working out in a sweat suit (rubber suit), restricting total caloric (by dieting and fasting) and fluid intake. Pseudoextreme/abuse medical practices which are sometimes employed include use of diuretics, enemas, laxatives, diet pills, abuse of prescription weight loss drugs and sporting bulimia (induced vomiting) among others.^{2,3}

Since professional combat sports events such as boxing and MMA are associated with a high risk of acute neurological, orthopedic, and ophthalmological injuries, by law all professional boxing and MMA bouts require the presence of qualified physician(s) in attendance. These physicians commonly referred to as ringside physicians' hailing from various medical specialties such as neurology, orthopedics, emergency medicine, general medicine, sports medicine are entrusted to protect the health of the combatants. In the United States and abroad, events are regulated by State Athletic Commissions (SAC). Ringside physicians are either independent contractors (hired by the event promoter) or work directly for SAC. In MMA official weigh-ins usually occur about 24 hours before the contest. Depending upon the number of fights, there are usually between 1 to 3 ringside physicians in attendance at the weigh-in physical. There is typically no EMS coverage or Level I trauma center on back up. Depending upon the size of the event (number of fights), there are anywhere between 2 to 7 ringside physicians in attendance on fight night. In addition there

are EMS personnel and anywhere from 1 to 4 ambulances at the venue. A Level I trauma center is usually on back up. Before the fights start, all combatants undergo a pre-fight medical evaluation. After the bout is over, the combatants are examined by the ringside physicians (post-bout medical evaluation). Stable fighters are discharged from the venue. Fighters with grievous injuries are transported via on-site ambulance to the trauma center for immediate assessment and management.

The dangers of extreme weight cutting in MMA have increasingly been recognized. Combatants typically dehydrate to cut their weight by 15-20 lbs. for the weigh-in. Cutting is hazardous. Once the weigh-in is over and the combatant successfully makes weight, rapid rehydration follows. Cardiovascular collapse due to extreme weight cutting is mostly likely to occur at the time of the weigh-in. Most MMA promotions do not offer long-term health insurance to combatants fighting under their banner. Combatants are usually covered only for injuries that occur inside the cage. To ensure the health and safety of combatants, there should be adequate medical staffing at the time of the weigh-in. In addition to ringside physicians, EMS personnel and at least one ambulance should be present. Combatants should have a comprehensive long-term medical insurance policy that covers them not just for injuries sustained inside the cage during a sanctioned fight but also for those that may occur at the time of the weigh-in, media events and other promotional appearances.

Conclusion

Ringside physicians, SAC officials, MMA sports promotion bodies, combatants and their camps should be educated about the danger of extreme weight cutting. Cutting is hazardous. Sudden cardiovascular collapse due to a “bad weight-cut” is most likely to occur at the time

of the weigh-in. Hence weigh-ins should have medical personnel on site. This includes an adequate number of ringside physicians, EMS personnel and ambulance services. We should advocate for comprehensive long-term health insurance for fighters that covers them for injuries that occur not just inside the cage but also at the time of weigh-in, media event and other promotional appearances.

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Conflicts of interest

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