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Identifying a high-risk fighter in boxing

Abstract

Boxing is one of the most popular of combat sports. The goal in boxing is to win by causing a knockout (KO). Every punch thrown at the opponent's head is thrown with this intention. As a result boxers experience numerous head impact exposures (HIE) both in and out of competition. The sport carries a high incidence of acute and chronic traumatic brain injury (TBI) as well as occasional disabling orthopedic and ophthalmological injury. While no fighter (combatant) is immune to these injuries, there are fighters who for various reasons are more susceptible to these injuries or in whom these injuries carry high morbidity and mortality. These fighters are colloquially referred to as "high-risk fighters". A high-risk fighter needs closer medical supervision before, during and after a bout. In this commentary an attempt is made to identify these high risk fighters.

Keywords: boxing, combat sports, injuries, combatant

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Identifying a high-risk fighter in boxing

The argument can be made that every boxer is a high-risk fighter. Boxing as a sport can never be made totally safe. Close medical supervision of the sport, robust medical protocols designed to protect fighters help to make the sport safer. In spite of our best efforts, boxers will unfortunately continue to succumb to injuries either in the ring itself or in the immediate aftermath of a bout. Traumatic subdural hematoma (SDH) remains the most common cause of boxing related mortality.

So, which fighter qualifies as a high-risk fighter and why? There is no clear consensus on this. As per the New York State Athletic Commission (NYSAC) Medical Manual on Medical Standards for Combat Sports Professionals a High-Risk Combatant is a combatant who falls into any one, or more, of the following categories:

1. 40+ years old;
2. 6 consecutive losses in any manner in any professional combat sport;
3. 3 consecutive losses by technical knockout (TKO)/ knockout (KO);
4. 1+ year(s) of inactivity after start of professional career;
5. 10 losses or more as a professional combatant;

Let us consider these categories one by one.

Age: A combatant 40 years of age or older is currently identified as a high-risk combatant. There is no peer reviewed medical studies that support the hypothesis that age greater than 40, makes a combatant more prone or susceptible to suffering an acute TBI in the ring. Peer reviewed medical literature also lacks evidence that age greater than 40, makes a combatant more susceptible to orthopedic or ophthalmological studies. The hypothesis that is more grounded in science is that older combatants might take longer time to recover from these injuries and suffer a greater degree of morbidity as compared to younger combatants. Well planned research studies are needed to answer the above questions definitely.

a) Acute traumatic SDH remains the most common neurological cause of boxing related morbidity and mortality. It usually does not occur in isolation and neuroimaging reveals concurrent varying degrees of subarachnoid hemorrhage (SAH), frontal and temporal contusions and diffuse axonal injury (DAI). With regards to epidemiology, as the population ages, the incidence of acute and chronic SDH increases (Figure 1).[1] Chronic SDH incidence ranges from 1.72 to 20.6 per 100,000 persons per year. Risk factors include advancing age, male gender, and antiplatelet or anticoagulant use.[2] A professional boxer is usually in good health and unlikely to be on chronic antiplatelet or anticoagulant therapy. While there is no study in the medical literature, the incidence of acute and chronic SDH is likely to be the same in a boxer 20 years of age and one who is between the age range of 40-50. Age certainly becomes a factor when we are taking of boxers in the age range of 50 and beyond. There is limited evidence to suggest that the incidence of brain vascular malformations such as aneurysms and arteriovenous malformations (AVM) increases with age. What is more likely is that these occult lesions present clinically at a later age. Thus the Association of Ringside Physicians in its Neuroimaging Consensus Guidelines recommends a CTA or MRA of the brain in addition to an MRI of the brain at the time of initial licensure for all combat sports athletes 40 years or older.[3]

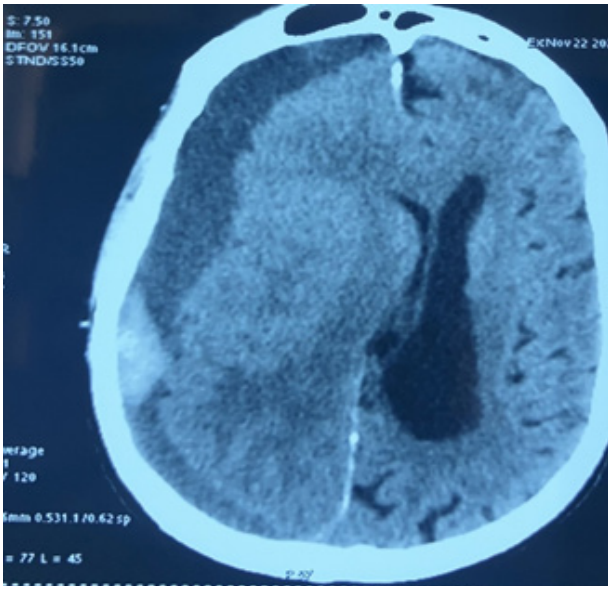

Figure 1 A large acute on chronic subdural hematoma in an 80-year-old patient.

b) Cardiovascular status becomes a concern as an athlete ages. Boxers usually are in excellent cardiac health with resting heart rate in the range of 50-60. Electocardiogram (EKG) of these elite athletes is frequently compatible with an athlete's heart. Regular exercise is believed to promote structural, functional, and electrical remodeling of the heart. These structural and electrophysiological changes are often referred to as the "athlete's heart". Endurance sports such as boxing are associated with the greatest degree of cardiac remodeling.[4] Young boxers lack cardiovascular risk factors. Sudden death due to blunt force trauma to the chest-wall (commotio cordis) during a bout though has been reported.[5] The exact mechanism of this injury remains unknown. Likely the blunt force trauma triggers a malignant ventricular arrhythmia (ventricular fibrillation).[6] As a boxer ages cardiovascular risk factors such as essential hypertension, diabetes mellitus and dyslipidemia become common. Cross-sectional studies in middle-aged and older male athletes have revealed increased coronary artery calcification and atherosclerotic plaques, which were related to the amount and intensity of lifelong exercise.[7] Research studies are lacking and we do not know whether an older boxer is more susceptible to an acute coronary event while in training and competition. Risk stratification, a technique for systematically categorizing patients based on their health status and other factors should be applied to middle-aged and older boxer. A older boxer with cardiovascular risk factors should undergo an EKG, echocardiogram (ECHO) and cardiology clearance prior to competition.

Boxing record: Does a poor amateur or professional boxing record make a combatant high risk and more prone to boxing related injuries? This again is a difficult question to answer scientifically. Having more than 6 consecutive losses in any manner, 3 or more consecutive losses by TKO or KO, 10 losses or more as a professional combatant suggests that the combatant is not the most accomplished in his chosen profession. Pitting such a combatant against a more accomplished boxer threatens his health and safety in the ring. That is where the role of a matchmaker gains significance. The matchmaker is the person tasked to arrange bouts between boxers. It is said that matchmaking is an art. It's hard to get it right and easy to get it wrong. You want two combatants of equal skillset and similar records to enter the ring. Unfortunately far too often that is not the case. A financial interest of the involved parties frequently determines which fights get made. It is here that regulatory oversight by State Athletic Commissions is vital.

Period of inactivity: The best way to keep any skill sharp is to practice it daily. Boxing is no different. While boxing drills, running and sparring help to keep a boxer in shape, they cannot substitute the experience of an actual fight. Ring rust, a commonly used term in boxing refers to the loss of mental acuity and boxing prowess after been away from competition for approximately a year or more. Hence a boxer entering the ring after a prolonged period of inactivity needs closer medical supervision leading up to the fight, during and immediately after the fight. Period of inactivity though is a relative rather than absolute indication of a high-risk fighter. COVID-19 pandemic caused significant disruption to the world sporting calendar. Professional boxing was no different. Most boxers did not have a professional fight in 2020, 2021 and 2022. Listing all of these fighters as high-risk because of inactivity makes little sense. Floyd Mayweather is considered by many to be among the best pound for pound boxers to ever enter a ring. In his illustrious career he has a perfect 50-0 record. What if after his 40th fight, he took a year off for personal reasons. Would that automatically make Floyd a high-risk fighter? As things stand now, yes. This again is unreasonable.

Conclusion

As a sport boxing is unique in that very punch thrown at the opponent's head is thrown with the intention of winning by KO. The sport is associated with a high rate of neurological, orthopedic and ophthalmological injuries. Boxers die in the ring or in the immediate aftermath of a bout due to traumatic SDH. In no sport should an athlete die. Considering the sobering statistics, every fighter is a high-risk fighter. Boxers above the age of 40 may warrant more stringent medical supervision and oversight. Unfortunately, there are no one-size-fits-all criteria when it comes to identification of high-risk fighters in boxing. Individualized medical decision making should be exercised to determine fitness to fight for middle-aged and older boxers.

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Conflicts of interest

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References

1. Karibe H, Hayashi T, Hirano T, et al. Surgical management of traumatic acute subdural hematoma in adults: a review. *Neurol Med Chir (Tokyo)*. 2014;54:887–894.
2. Yang W, Huang J. Chronic subdural hematoma: epidemiology and natural history. *Neurosurg Clin N Am*. 2017;28:205–210.
3. Sethi NK, Neidecker J. Neuroimaging in professional combat sports: consensus statement from the association of ringside physicians. *Phys Sportsmed*. 2023;51:343–350.
4. La Gerche A, Wasfy MM, Brosnan MJ, et al. The athlete's heart-challenges and controversies: JACC focus seminar 4/4. *J Am Coll Cardiol*. 2022;80:1346–1362.
5. Bianco M, Colella F, Pannozzo A, et al. Boxing and "commotio cordis": ECG and humoral study. *Int J Sports Med*. 2005;26:151–157.
6. Link MS, Wang PJ, Pandian NG, et al. An experimental model of sudden death due to low-energy chest-wall impact (commotio cordis). *N Engl J Med*. 1998;338:1805–1811.
7. Aengevaeren VL, Mosterd A, Bakker EA, et al. Exercise volume versus intensity and the progression of coronary atherosclerosis in middle-aged and older athletes: findings from the MARC-2 study. *Circulation*. 2023;147:993–1003.