

Neurologist at ringside - to be or not to be?

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Background: Ringside physicians are entrusted with the task of protecting the health and safety of combat sports (boxing and mixed martial arts (MMA)) athletes. Ringside physicians come from various disciplines of medicine such as, primary care, internal medicine, orthopaedics, sports medicine, and otolaryngology. However, there are few neurologists who work as ringside physicians.

Discussion: Boxing and MMA are highly controversial sports for a neurologist's involvement because every punch and kick to the head is thrown with the intention of winning by knocking the opponent out, or resulting in a concussion. Thus many neurologists feel it is unethical to support boxing as a ringside physician.

Conclusion: Boxing and MMA are universally thought to be harmful to the brain, and nearly all medical associations have made calls to ban boxing and MMA. While medical associations and physicians, including neurologists, may not support boxing or MMA, their presence at the ringside or cageside helps to make these sports safer through protecting the health and safety of a combat sports athlete.

Keywords: boxing, MMA, traumatic brain injury, chronic traumatic encephalopathy, physician

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The risks for both acute and chronic traumatic brain injury are high in contact sports such as professional boxing and mixed martial arts (MMA). Acute neurological injuries, such as subdural haematoma (SDH), epidural haematoma (EDH), subarachnoid haemorrhage (SAH), intracranial haemorrhage (ICH), diffuse brain contusions without associated haemorrhages, diffuse axonal injuries (DAI) and dissection of the vertebral artery/carotid artery, are major causes of boxing-related mortality and morbidity. The burden of chronic neurological injuries in boxing and MMA, like chronic traumatic encephalopathy (CTE), dementia pugilistica, chronic post-concussion syndrome, chronic neurocognitive impairment, post-traumatic dementia, post-traumatic cognitive impairment, post-traumatic parkinsonism and persistent post-traumatic headache, is likely much higher but hidden as most injuries express themselves after the combat sports athlete has long retired.

Ethical issues and position statements of various medical associations

Ethical issues related to combat sports have been debated vigorously in the medical literature. Boxing and MMA are invariably thought to be harmful for the brain by the medical community. Various medical associations have recommended in their position statements to ban boxing altogether. The American Medical Association (AMA) recommended that until boxing is banned, head blows should be prohibited from the sport^[1]. The American Academy of Pediatrics (1997) opposes boxing as a sport for any child, adolescent, or young adult. The

Australian Medical Association (AMA) (1997. Reaffirmed 2007)^[3] stated:

'All forms of boxing are a public demonstration of interpersonal violence which is unique among sporting activities. Victory is obtained by inflicting on the opponent such a measure of physical injury that the opponent is unable to continue, or which at least can be seen to be significantly greater than is received in return'.

The AMA opposes all forms of boxing and recommends the prohibition of all forms of boxing for people younger than 18 years. The AMA further recommended to the International Olympic Committee and the Australian Commonwealth Games Association that boxing be banned from both the Olympic and Commonwealth Games and that media coverage of boxing should be subject to control codes similar to those which apply to television screening of violence. British Medical Association (BMA) opposes amateur and professional boxing; and called for complete ban on boxing; recommending banning boxing for those younger than 16 years old.^[4] The Canadian Medical Association (CMA) recommended that all boxing be banned in Canada.^[5] The World Medical Association (WMA) recommended that boxing be banned.^[6]

The American Academy of Neurology (AAN) in its position statement on sports states that where injuries result in intentional trauma to the brain (for example, from boxing, MMA, and extreme fighting), these sports are a serious threat to the neurologic function of those who engage in them and makes the following recommendations:^[7]

1. Be regulated to reduce the occurrence of permanent brain damage by reduction in the number of direct blows to the head.
2. Have a programme to provide participants in these sports:
 - *Required formal neurologic examinations, including brain imaging, at regular intervals for all participants who have been knocked unconscious.
 - *Additional testing be recommended and monitored by a neurologist who is designated by the State Athletic Commission.

Dr Hauser in his article titled "Beaten into action: a perspective on blood sports" makes a passionate plea to the neurology community to ban boxing, stating:

'The medical, and especially the neurology, community has an obligation to do more. We need to spread the word that brain bashing is not a socially acceptable spectator sport, and partner with our national organizations to expand and improve the effectiveness of public awareness and other educational initiatives. We should forcefully counter articles in the medical literature taking the position that closer medical supervision could obviate the need for a ban, or even worse that consenting adults have the ethical right to maim each other if they choose to do so. Finally, we should avoid the temptation

to align with groups whose purpose is anathema to our mission, no matter how great our financial need'.^[8]

The arguments of Dr Hauser and others who share his viewpoint have been countered in the medical literature by a few "brave" authors who then risk been labelled either as mavericks or "fans of the sport".^[9,10]

Over the years, it has also been vigorously debated in the boxing and scientific communities as to whether the sports of boxing and now MMA can be made safer. Suggestions included restricting the number of shots to the head (this will mandate changes in the rules of the sports), reducing the number of rounds per fight, making headgear mandatory for both amateur and professional fighters, restricting the number of fights per year per fighter, better designed mouthpieces, and by instituting longer periods of mandatory suspension between fights. Those on the other side of the fence have countered that these sports cannot be made safer, that no amount of boxing is good for the brain (4 rounds vs. 12 rounds per fight, 4 fights vs. 40 fights in a boxer's professional career), and that one punch can change everything – it may even kill.

The neurologist at ringside

Is the presence of a neurologist ringside or cageside synonymous with him or her supporting or in any way promoting these sports? Military doctors (army physicians), for example, work in the battlefield saving the lives of soldiers and sometimes even of the enemy. However, their role in the frontlines does not mean that they personally support the war or feel that war is good and justified. There is no doubt that by bringing in their critical life-saving skills, their presence saves precious lives in battlefields across the globe. In much the same way, the presence of a neurologist at the ringside or cageside does not imply that he/she supports boxing or thinks that boxing is good for the brain. Neurologists too bring their unique life-saving skills to the ringside/cageside. Brain imaging, either computed tomography (CT) or magnetic resonance imaging (MRI), is currently included in the process of registering for a license to fight in combat sports. However, the imaging requirements for licensure vary among different Athletic Commissions. Some state commissions in the United States require an MRI brain scan every three years, others only once, at the time of licensure. Some do not require any imaging before licensure.^[11] Brain imaging, particularly a CT scan of the head, is currently the imaging modality of choice to rule out acute traumatic brain injury after a bout of boxing. There are no guidelines regarding the imaging for chronic traumatic brain injury and chronic traumatic encephalopathy as a result of a fight injury. Reviewing these scans and determining brain fitness to fight is a task best suited to a neurologist. Assessing for concussion and traumatic brain injury during the course of a fight is no easy task. The signs and symptoms are often subtle. A headache is not usually reported by a fighter. Memory and dysarthria are difficult to assess ringside in the one minute rest period between rounds. Assessing the fighter's balance (by the way he walks back to his corner), the presence of a confused state (the fighter walks to the wrong corner after the bell), the presence of irritability (the fighter lashes out at the referee, corner, or inspector) is best gauged by a neurologist by virtue of his training. Determining brain fitness after a fight is also best undertaken by a neurologist. Management should be on a case-to-case basis, with some combatants meriting discharge from the venue after a neurological evaluation and medical clearance

by the physician. Others merit transport to the nearest Level 1 Trauma Centre for a CT head scan and further care as deemed necessary.

Conclusion

In some US states and in other countries around the world, the referee and the ringside physician are the sole arbiters of a fight and the only individuals authorised to enter the fighting area at any time during the competition and to stop a fight. For the reasons highlighted above, some Commissions, such as the New York State Athletic Commission (NYSAC) have mandated that the Chief Medical Officer be a trained neurologist or a neurosurgeon. This author would like to propose that these specialists at the ringside or cageside contribute to making these sports safer.

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