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Risk and Injuries in Contact Fighting

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As martial artists, we face difficult choices as we train. The closer we come to modeling the reality of a military or self-defense situation, the more likely we are to sustain (or cause) serious injuries. Thus, it is important to know whether the benefits of contact training outweigh the risks involved.

Contact can mean many different things. After all, there is a difference between a light punch with gloves to an elbow to the face, a controlled hip throw on a mat to a body-slam into the chairs. In addition, it can occur in a variety of situations ranging from friendly competition in a martial arts club to a professional fight. In this discussion, all of these scenarios are considered, but it must be remembered that details matter. The unifying theme, however, is the theory that increasing contact during training and competition leads to both faster learning and increased risk of injury.

An excellent example of this trade-off comes from a French study that looked at previously injured judoists and their abilities, and reached the surprising conclusion that the judoists with prior injuries developed "improved sensory and cognitive adaptation abilities." Most astonishingly, the worst injuries were associated with greater improvement in balance. The article concluded, "Although high-level sports develop specific physiological and sensorimotor abilities involved in balance control, they also increase the risk of injuries."(1) But of course, this study did not follow the people who quit judo because of similar injuries. Moreover, it did not consider motivation. Otherwise, how to explain the need for workers' compensation or sport medicine?

Anyway, different schools have approached this issue of contact in different ways. Some embrace intense full-contact fighting, while others shy away from all competitive training. For instance, note the following explanation of pushing hands sparring used by practitioners of the Chinese martial art of Tai Chi:

Pushing Hands is a simplified form of sparring popular with students of Tai Chi. Lacking the punches and kicks common in the practice fighting of many external martial arts, Pushing Hands is a gentle sport of control where success is achieved by upsetting the balance of one's opponent. Typically, participants begin facing one another, each in a bow stance. Each participant has his or her outside hand on the elbow of their opponent and the inside hand on the wrist. As the match begins, the pair use their hands to push against one another, seeking to control one another's energy. Sudden or forceful shoving is taboo. The victor should be the pusher of the greatest skill, not the greatest brutishness. (2)

It is hard to imagine that this type of sparring causes many injuries to the participants. Thus, this method can be viewed as a good way of practicing martial arts, as it allows the practitioners to practice skills and techniques that might be useful in a self-defense situation without causing serious injury during training. Additionally, the practice probably helps the practitioner learn to remain calm, and also to control internal energy. Both of these qualities are certainly important in any fight or self-defense situation. At the same time, however, the dissociation from fear associated with this type of

sparring is not very realistic, in terms of truly antagonistic scenarios. Thus, this relatively gentle approach to sparring contrasts starkly with the method used by modern practitioners of mixed martial arts (MMA), Brazilian Jiu-Jitsu, and other high-contact arts. These styles have become popularized by a wave of no-holds-barred (NHB) competitions, most notable the Ultimate Fighting Championship (UFC), where grappling arts, in particular Brazilian Jiu-Jitsu, became a household name after the accomplishments of the Gracie family and their style.

Brazilian Jiu-Jitsu is not usually a particularly "gentle art". For instance, Carlos Gracie, one of the earliest practitioners of the style of Jiu-Jitsu that eventually became what today is known as Brazilian Jiu-Jitsu, once issued the following challenge: "If you want to get your face beaten and well smashed, your... kicked, and your arms broken, contact Carlos Gracie at this address..." (3) Gracie's invitation makes apparent not only the aggressive training methods of practitioners of Brazilian Jiu-Jitsu, but also the attitude and general approach towards fighting that they embody.

Full contact is employed as a method of training under more "realistic" conditions. Although hurting the partner is not the goal, the methods are intended to simulate the lack of cooperation one would expect from a real opponent or attacker. Thus, Roy Harris, an expert in several martial arts including Jeet Kune Do, Karate, and Brazilian Jiu-Jitsu, writes in his article *Effectiveness in Fighting* that "sparring is one of the best tools to develop the timing of your techniques. For when you spar, you truly do not know what your opponent will do, so you must respond accordingly. You must develop your reflexes." (4)

In other words, sparring partners stop when they hurt you, and punching bags don't hit back.

The concern that some have with such training, however, is that this more aggressive approach may lead to serious injuries. Thus, some people, like Arizona Senator John McCain, are against Ultimate Fighting. As one author put it, the senator was "horrified at the ground fighting, kicks, and head butts seen in such competitions. It was 'barbaric,' he said. It was 'not a sport.' He sent letters to all 50 governors asking them to ban ultimate fighting. The outcry against 'human cockfighting' became a crusade, and like many crusades, it was founded on misunderstanding." (5) After all, Ultimate Fighting is probably no more dangerous than boxing, where known risks include subdural hematoma. A properly located strike to the head (or a series of less accurate blows) can cause tearing to the bridging veins that connect the brain and the sinuses that carry blood away from the brain. This condition is thought to be the most common cause of fatalities in competitive boxing (6) (7), and is a risk in other contact sports as well.

Other injuries associated with martial arts, boxing, judo, and similar sports are broken bones, tears of the knees, sprains of the shoulders and ankles, and assorted infections. True, such injuries in combative training situations, while elevated over non-contact training, are comparatively rare. But they do happen, and they are (or have the potential to become) very serious injuries. And, due to the nature of the sport, boxing or martial art injuries attract far more attention due to the way they were received than if they occurred while the injured person had been simply walking down the street.

Thus, what we need to do is determine the actual rates per thousand exposures. Unfortunately, so far as I can tell, no one knows the real numbers of injuries. Instead, everyone seems to be arguing anecdotally rather than objectively.

A search of "Martial Arts Injuries" in PubMed Plus (a major Internet search engine that searches for topics in clinical medicine across a large number of major research journals) yielded only 107 articles. Of these, I was unable to find even a single article that compared the injury rates of different martial arts to one another. And, in the articles about individual martial arts, there is not even unanimity about what the most dangerous techniques are.

For example, when used by law enforcement officials, the chokehold has been implicated in several deaths (8). There was also a study described a 29-year-old man who developed an embolic stroke

after "neck holding maneuvers" at a martial arts class (9). Nonetheless, most authorities believe that a choke, released in a reasonable time, is a generally benign technique unlikely to cause lasting damage. Indeed, one study recorded that, "while professional boxers may show brain functional impairment in comparison to normal subjects, judoists do not." (10) A second study confirmed these findings, concluding, "There is no evidence of permanent CNS (central nervous system) functional changes due to judo practice and choking." (11). Although a third study raised the concern that "choking in judo may induce subclinical electroencephalographic perturbations" (12), there was no evidence that any of these changes were at all relevant since there was no documented loss of function in this study either.

Similarly, NHB competitions have been a focal point for public concern. Therefore, you would expect them to be well studied. This has not happened, at least in the medical journals searched by PubMed Plus. In popular media, however, Brian Kodi gives an excellent approximation of the issue. He writes regarding the death of Douglas Dredge in a NHB competition that:

Mr. Dedge's death inevitably brings up the issue of safety in NHB. MMA (mixed martial arts) events are inherently dangerous. Death, which is not uncommon in many other "safer" athletics, is inevitable in NHB. Those who tout NHB as a safer sport than boxing should take note of the following: Kevin Neuendorf, a media and public relations assistant at USA Boxing, the governing organization for U.S. amateur boxing says that in 1992, the last year for which he had complete statistics, USA Boxing put on 23,528 bouts, and there were 87 insurance claims for injuries and two for deaths. And these are only amateur bouts. The number of pro boxing fights around the world very likely far exceeds this number. The American Journal of Medical Association (JAMA) puts boxing deaths at a rate of 0.13 per 1,000... UFCs (ultimate fighting competitions) have been around since 1993 with an average of 7 fights per event and 5 shows per year. The total number of UFC matches has not exceeded 180 in 5 years. Conservatively speaking, if there were 20 additional NHB organizations since 1993 with roughly the same number of fights as the UFCs, the sum of all MMA fights worldwide in 5 years would be under 3,780 and there's already one accounted death. While it may be too early to tell, MMA risk for death appears to be at least two times higher than that of boxing." (13)

Kodi's calculations take into account a number of assumptions that may or may not be true. Thus, the numbers are not necessarily statistically valid. However, his calculation is an interesting approximation and the fact that there has been even one death in a NHB match is alarming, considering there have been relatively few of them.

The concrete data that does exist in the established medical literature mostly relates to striking arts, perhaps due to the medical community's longer-term interest in boxing. As is the case with boxing, most of the known studies show that striking arts result in high injury rates. In his landmark paper that followed over 15,000 international martial artists over 18 years, Birrer showed that while overall injury rates were low, sparring was responsible for an incredible 74% of the injuries in taekwondo and karate. (14)

Another grimly titled study, *Morbidity and mortality in the martial arts: A warning*, chronicled a series of injury anecdotes that were reported over 10 years over major martial arts activities. There was even one video-recorded fatality that the authors believed "demonstrate(s) the danger inherent in participation" in such activities. They also document the potential for serious neurological injury. (15)

Only one study of Muay Thai kickboxing, a sport and martial art centered on competitive fighting, was found. Muay Thai kickboxing has an injury rate of between 2 to 14 per 1,000 participants per year. (16) This is a rate is similar to injury rates in other striking arts such as taekwondo and karate. Although deaths occur in Muay Thai, as in boxing, sprained fingers and toes, cuts and bruises on the

head, face, and neck, and bloody noses are the more typical injuries.

Ultimately, one makes one's decisions based on the best available information. In terms of sparring activities, practitioners and teachers must fairly assess whether the benefits of rigorous sparring, which are self-evident to most practitioners in developing essential fighting skills, are worth the injuries that are sustained while training. Additionally, it is useful to determine what increases training benefits while minimizing injuries. Thus, to give some examples, the use (or non-use) of protective gear, regulations regarding strikes to certain areas of the body, specific requirements of "tapping out", and other details should be investigated both for effectiveness in training and risk of injury.

This said, the existing information tends to be anecdotal rather than objective, and sometimes polemical rather than scientific in tone. Injuries sustained in full-contact fighting arts, in particular martial grappling arts and professional MMA competitions, have not been well cataloged in peer-reviewed medical and scientific research methods. Nonetheless, there is evidence of increased risk of brain and joint injuries, with brain injuries more common in striking sports while joint injuries are more common in grappling sports. There is also anecdotal evidence to suggest that participation in tournaments and contests leads to a higher risk of injury than does participation in friendly non-competitive training. The injury rates in MMA are not known, but are probably comparable to boxing and wrestling arts.

Endnotes

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