

TRAUMATOLOGY IN JUDO DISCIPLINE

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RIASSUNTO

Il judo è un'arte marziale, una disciplina di combattimento e un metodo di autodifesa formalmente nato nel 1882 in Giappone, dopo che il Prof. Jikoro Kano ha fondato Kodokan. Dal 1964 il judo è diventato ufficialmente una disciplina olimpica in occasione dei Giochi Olimpici di Tokyo.

Questo studio analizza un periodo di tempo dal 2008 al 2013 ed una popolazione di 240 atleti divisi in due gruppi: il gruppo A formato da atleti sotto i 12 anni di età comprende 177 persone, mentre il gruppo B formato da persone di età superiore a 12 anni comprende 63 atleti. Sono stati presi in considerazione solo i traumi maggiori.

Nel periodo considerato sono stati individuati 43 traumi in tutto tra i due gruppi, 37 eventi traumatici per il gruppo B che rappresenta l'86% degli eventi considerati mentre per il gruppo A nello stesso periodo abbiamo registrato 6 traumi, che rappresentano il 14% dei traumi totali. Tra gli adulti il 58,7% ha subito un trauma maggiore, mentre tra i bambini il 3,4%.

Pertanto sembra che gli infortuni colpiscano più gli adulti che i bambini. Potrebbe essere utile far capire agli atleti i meccanismi dei vari traumi e permettere loro una accurata preparazione atletica per ridurre il numero di traumi maggiori.

Parole chiave: Judo · Traumatologia · Atleti

ABSTRACT

Judo is a martial art, a combat discipline and a method of self-defense formally born in 1882 in Japan, after Prof. Jikoro Kano founded Kodokan. Since 1964 judo has officially become an Olympic discipline for the Tokyo Olympic Games.

This study analyzes a period of time from 2008 to 2013 and a population of 240 athletes divided into two groups: group A formed by athletes under 12 years of age includes 177 people, while group B formed by people over 12 years old includes 63 athletes. Only major traumas were taken into account.

Over the considered period, there were overall 43 traumas in the two groups: 37 traumatic events for group B representing 86% of the events considered, while for group A in the same period we recorded 6 traumas, which represent 14% of the total traumas. Among adults, 58.7% suffered major trauma, while 3.4% among children. Thus it seems that accidents affect more adults than children. It could be useful to make athletes understand the mechanisms of the various traumas and to allow them a thorough athletic training to reduce the number of major traumas.

Keywords: Judo · Traumatology · Athletes

Background: Judo is a martial art, a fighting discipline and a self-defence method formally born in 1882 in Japan, after Prof. Jikoro Kano founded Kodokan. By 1964 judo become officially an Olympic discipline in occasion of Tokyo Olympic Games.

Materials and methods: We analysed a period of time since 2008 to 2013. The population considered counted 240 athletes divided in two groups: group A is formed by athletes under 12 years of age, while group B is formed by people over 12 years of age.

Results: In the considered period of time we discovered 37 traumatic events for group B. That represents 86% of considered population. Considering events for group A in the same period of time we registered 6 traumas, involving 14% of athletes.

Conclusions: It is possible to say that the total number of injuries in our observation was underestimated. It could be useful to define mechanisms of most frequent traumas to reduce the number of injuries.

INTRODUCTION

Judo is a martial art, a fighting discipline and a self-defence method formally born in 1882 in Japan, after Prof. Jikoro Kano founded Kodokan. By 1964 judo became officially an Olympic discipline in occasion of Tokyo Olympic Games. At 2012 London Olympic Games competed in judo 387 athletes from 135 different countries. Judo is the third sport in terms of popularity around the world by now.

The word “Judo” comes from:

JU → way DO → compliancy

Illustrating in that way the *yawara* principle of conforming self-existence following the rule of “best expenditure of energy”.

In this discipline is requested a specific terminology:

- *Judoka*: judo athlete
- *Judogi*: judoka's outfit
- *Obi*: belt of different colours depending on the athlete's level
- *Tori*: the attacking one
- *Uke*: the one who undergoes the attack

First proofs of judo in Italy came from a group of soldiers belonging to Regia Marina who did an exhibition of “*Japanese fighting*” to Vittorio Emanuele III King of Italy, in 1905. During the National Assembly, in 2000, FIJLKAM (Italian Federation of Judo Fight Karate Martial Arts) was founded.

Long-term effects of judo training have also been described, including being a possible cause for development of osteoarthritis of the fingers and elbow, and developing anoxic brain damage due to frequent strangulation.

In adult males, injury rates vary between 25.2 and 122.6/1000, and females, between 34.3 and 130.6/1000. In judokas aged 16 years or below, injuries occur within this range for both males and females.

The purpose of this paper is to define the most recurrent traumatic events in judo athletes. Several aspects concerning judo's traumatology were considered and related to the existing literature about this topic.

MATERIALS AND METHODS

We considered two judo gyms located in Tuscany:

- Judo Carrara;
- Ren Shu Kan Pietrasanta.

We analysed a period of time since 2008 to 2013. The population considered counted 240 athletes divided in two groups: group A is formed by athletes under 12 years of age, while group B is formed by people over 12 years of age. Group A counted 177 athletes, while group B counted 63 athletes. In the considered period of time a total of 43 traumas happened, respectively 6 for group A and 37 for group B.

We didn't consider minor traumatisms, like contusions or distortions. We didn't distinguish between accidents happened during training and the ones happened during an official competition. We found that in most cases injuries followed major traumas.

The analysis was made consulting registers of injury charges done by athletes. On the basis of this we could verify the number and the nature of traumatisms.

RESULTS

In the considered period of time we discovered 37 traumatic events for group B. That represents 86% of the considered population. In particular we found that traumas were divided in the following way: 7 acromion-clavicle dislocations (19%), 5 anterior cruciate ligament wounds (13,5%), 4 shoulder dislocations (11%), 4 metatarsal or phalanx fractures (11%), 3 ribs fractures (8%), 3 meniscus wounds (8%), 2 clavicle fractures (5,4%), 2 nasal bones fractures (5,4%), 2 lacerated and contused wounds (5,4%), 1 mandibular fracture (2,7%), 1 elbow dislocation (2,7%), 1 pulled muscle (2,7%), 1 long head of biceps lesion (2,7%), 1 medial collateral ligament lesion (2,7%). If we consider only most important lesions in this population, we see that 54,6% of group B athletes' accidents are major injuries; the others are minor traumas.

Considering events for group A in the same period of time we registered 6 traumas, involving 14% of athletes. We registered 3 clavicle fractures (50%

of total), 1 V toe fracture (16,7%), an Achilles' tendon wound (16,7%) and a cranial trauma (16,7%). We can affirm that a major trauma involved 3,4%. So in adults most common injuries are shoulder dislocations (11%), acromion-clavicle dislocations (19%) and anterior cruciate ligament wounds (13%), whereas in people under 12 years of age the most common trauma is clavicle fracture (50%).

DISCUSSION

The purpose of this study is to define most common traumas in judo athletes; it is important to analyse frequency of traumas in this discipline registered in literature in relation with the place where accidents occurred and the culture of local people.

C.M. Green *et al.*, studying a population of 392 adult judo athletes for a contemplated period of time (284 M, 108 F), registered a total of 53 injuries (40 M, 13 F):

- wound (8 M, 1 F);
- bruise (13 M, 5 F);
- fracture (1 M, 0 F);
- sprain (7 M; 5 F);
- others (1 M, 0 F);
- not specified (1 M, 0 F).

Following these authors we have to relate causes of injuries to athletes' weight loss in some periods of their career. They found that, in a judo athlete, a fast body weight loss superior than 5% of the total is a risk factor in terms of injuries, in particular upper limbs injuries. Traumas during a fight frequently happen when an athlete tries to grab the opponent, when someone is pushed down or in the attempt to push down the opponent. A *judoka* therefore is requested not to lose weight before a fight, in order to not self-expose to a higher risk of injuries.

S. Salanne *et al.* conducted a retrospective study in a period of time going from May 2006 to May 2008, including all patients under 15 years old who asked for a paediatric emergency unit. In this period of time were included 173 patients with a male-female ratio of 2,46. The average age was 10,6 years \pm 2,4. Many of subjects consid-

ered were hospitalised in the weekend (59%) and injuries were contusions (44%), fractures (31%), distortions (19%), dislocations (3%) and wounds (3%). Upper limbs were involved more frequently than lower limbs (46% vs 25%), with a prevalence of male subjects (78%) and a prevalence of fractures (54% of injuries), especially clavicle fracture (72%) compared to other traumas. According to the Authors, traumas in young judo athletes are habitual accidents that often present as benign lesions, and are different in terms of kind and distribution of lesion, compared to adult people. Risk factors determining a higher incidence of injuries are: body weight loss higher than 5% or overweight, age, male gender and experience in judo practicing. Prevention of aforementioned factors during training sessions and fights can decrease the rate of accidents.

Jones *et al.* confirmed an increase of childhood martial arts traumas of about 45% in the period from 1983 to 1998.

Stricevic *et al.* found that 42,1% of traumas in males and 48,1% in females happens during first match and there is not a correlation with age.

Touminem *et al.* said that experience in the discipline can lower the risk of injury.

An important Japanese study found that every utilised technique in judo discipline could lead to a specific trauma.

Kamitani *et al.* studied lesions caused by two specific judo techniques: *Osoto Gari* and *Uchi Mata*. The first one is an offensive technique finalized to strike down the opponent on his back, while the second one is a difficult technique that require a fighter to push the opponent with a leg under his crotch while he's standing in balance on the other leg. Considering these techniques 30 head traumas happened: 15 fighters died (50%), 5 survived in a persistent coma (17%), 6 developed a serious residual disability, hemiplegia or aphasia (20%), 4 recovered completely (13%). Cervical lesions resulted in 7 complete palsies (37%), 7 incomplete palsies (37%) and 5 complete recovers (26%)⁽³⁾.

In our study we found that injuries often followed a specific technique called *Seoi Nage*, which can be divided in *Ippon Seoi Nage* and *Marote Seoi Nage*. *Ippon Seoi Nage* means throwing away the opponent loading his weight on the back with a possible clavicle fracture by a direct trauma in kids who falls in a wrong way, while in adult

fighters the same trauma mode can cause an acromion-clavicle dislocation. In these cases the treatment choice depends on the athlete's needs: a conservative treatment is usually preferred. *Merote Seoi Nage* is characterised by a back rotation so it can cause an extra rotational trauma and, in adult fighters, it can determine a gleno-humeral dislocation if it isn't properly done. Furthermore we saw that *Tai Otoshi* technique can result in anterior cruciate ligament lesions. *Tai* means "body" and *Otoshi* "push down"; this technique is performed blocking the right leg of the opponent with own right leg, reversing him ahead.

Considering athletes with ligament injuries, only 4 of 5 subjects needed a surgical treatment for ACL lesions: 3 of them were treated with autologous graft and 1 with LARS. All of them started their training after therapy. The one who wasn't surgically treated was affected by a total ACL lesion plus a lateral collateral ligament lesion, and a previous lesion of medial collateral ligament, as confirmed by imaging exams. Nonetheless, he did an intense FKT cycle, and, despite these lesions, he won 3 European gold medals, 1 International bronze medal and 8 medals in national competitions.

CONCLUSIONS

It is possible to say that the total number of injuries in our observation was underestimated (we couldn't evaluate most frequent minor traumas). It could be useful to define mechanisms of most frequent traumas to reduce the number of injuries. A proper athletic preparation is an element of essential relevance in determining a reduction in the rate of injuries. Adults are most likely more vulnerable to injuries than kids, and this is maybe caused by a higher competitiveness, a lesser

pre-workout warming-up and lesser ligamentous flexibility. Therapeutic treatment has to be discussed together with the athlete and considering his needs.

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