13. 日本とヨーロッパにおける柔道による傷害の比較分析

熊本大学　小澤　雄二
別府大学　阿部　　淳
ドイツ　ハンブルグ大学　奥　　行男
ドイツ　ハンブルグ大学　Rainer GANSCHOW

13. Injuries in Judo: Comparison of the risk profile in Japan and Europe

Yuji Ozawa (Kumamoto University)
Jyun Abe (Beppu University)
Yukio Oku (University of Hamburg, Germany)
Rainer Ganschow (University of Hamburg, Germany)

Keywords: sports injury, prevention, Japan, Europe

要　約

柔道は、現在、世界中に普及し、日本以外ではヨーロッパで人気が高い。しかしながら、海外で行われている柔道は、日本の柔道とはやや趣の異なるものである。海外の柔道では、一本ではなくそれ以外のポイントを狙うなど、ルールを最大限に生かした、勝利優先の戦い方が重視される。

このような背景の基、ヨーロッパの国々では、日本の伝統的な柔道の練習方法とは異なった練習方法や試合方法が発達した。そのため、この違いが日本とヨーロッパにおける柔道によるケガの箇所や頻度などの違いとなって現れるのではないだろうか。そもそも、柔道によるケガに関する報告は少なく、我々の知る限りでは、複数の国の柔道家を調査対象とした柔道による傷害の比較調査は無い。そこで本研究では、日本とヨーロッパでの柔道の練習方法と柔道によるケガを、アンケート調査により比較分析し、傷害予防のための基礎的資料を得ることを目的とした。

本研究のアンケート調査は日本とドイツの合計1698人の柔道家から集め、今回は、ヨーロッパ柔道の代表としてドイツの傷害分析結果を採用した。なお、現在のドイツにおける柔道競技者登録人口は約20万人であり、日本とほぼ同数である。

主な結果は以下に示すとおりである。

（1）全般的傷害率

15％のドイツの柔道家および34%の日本人には、調査対象とされた3年間に医者などの専門家の治療を必要とするケガは無かった。また、1人あたりのゲガの頻度は、ドイツでは平均2.4回、日本では平均1.1回であった。

（2）ケガのタイプ

日本とドイツともに「関節包や靭帯の傷害」が最も多く、その次に「脱臼」が多かった。ドイツでは全ての傷害のうち12.7%が「筋肉の傷害」であるのに対し、日本では「筋肉の傷害」が僅か3.9%であった。また、「骨折」の割合はドイツでは2.5%であるのに対し、日本では14.0%であった。

（3）練習の再開

81.2％のドイツの調査対象者および70%の日本の調査対象者が、ケガが完治する以前に練習を再開したと回答した。

（4）慢性痛

18才以上の調査対象者のうち「慢性の筋肉痛」があると答えたのは、日本では0.3 %であるのに対し、ドイツでは34%であった。

（5）補強運動

12才以上の調査対象者のうち、ドイツでは28%、日本では90%が柔軟運動を行っていると回答した。つまり、日本ではドイツの3倍以上が柔軟運動を行っていることになる。また、日本では21%、ドイツでは22%の柔道家がウエイト・トレーニングなどの筋肉強化運動を行っていると回答した。

Introduction

Judo, meaning "gentle way", is a modern Japanese martial art and combat sport, which originated in Japan in the late nineteenth century. Its most prominent feature is its competitive element, where the object is either to throw one's opponent to the ground, immobilize or otherwise subdue one's opponent with a grappling maneuver or to force an opponent to submit by joint locking the elbow or by applying a choke. Judo has its roots in Jujitsu, which was the martial art of the samurai. The founder of Judo, Jigoro Kano, removed most life-threatening and potentially dangerous techniques and formed a martial art form that could be trained without injuring the partner. The main principle is to achieve most effect by least effort. Judo spread quickly to Europe and has gained popularity worldwide. As of 2007 about 200 countries are members of International Judo Federation. Since 1964 for men and since 1992 for women Judo is officially an Olympic sport(1).

Japanese training and combat style are considered as the traditional way of Judo, whereas European countries have influenced the international competition sport of Judo and also in the process developed other training philosophies and different styles. These differences could cause different risk profiles in Japan and in Europe. Reports on injuries in Judo are scarce and often restricted to a small group of athletes (3 – 10). To our knowledge there is no survey comparing injuries in judo by country. The objective of this study is (a) to elucidate the injury and training profile of judo athletes in Japan, and (b) to compare these results to European Judo athletes in order to provide a basis for injury prevention.

Material

The material consists of data from 1698 Judo athletes from Japan and Europe. We have employed the risk profile of German Judo athletes being representative of European Judo athletes. One reason for this is that an extensive study of the risk profile of German Judo athletes has earlier been performed by one of the authors (2). 898 Japanese and 800 German recreational and competitive Judo athletes were investigated with a retrospective questionnaires (Table 1).

Judo Experience	Japan	Germany
< 7	9	0
7- 11 years	189	205
12-17 years	317	206
18-29 years	270	198
> 29 years	113	191
Total	898	800

Table 1. Demographics (n)
表 1. 年齢ごとの調査対象柔道家の分布　（人）

Method

A questionnaire was distributed in the five northern states of Germany and in five representative prefectures in Japan. The questionnaire consisted of 13 categories of questions. We asked about injuries in the last three years. Only “serious” injuries that were treated by medical doctors or similar specialists were considered. Other “light” injuries were not taken into account.

In addition, we asked about age, sex, judo-grade, amount of judo experience (in years), amount of training per week, level of competition and the existence of chronic pain. We also inquired about types of supplementary training and about the state of recovery before restarting training after an injury.

Results

Overall injury rate:

15% (n = 120) of German and 34% (n = 300) of Japanese Judo athletes had no serious injury in the previous 3 years. The average number of injuries was 2.4 per person in Germany and 1.1 in Japan.

Injury location:

A comparison of injury location between Japan and Germany is shown in Fig. 1.

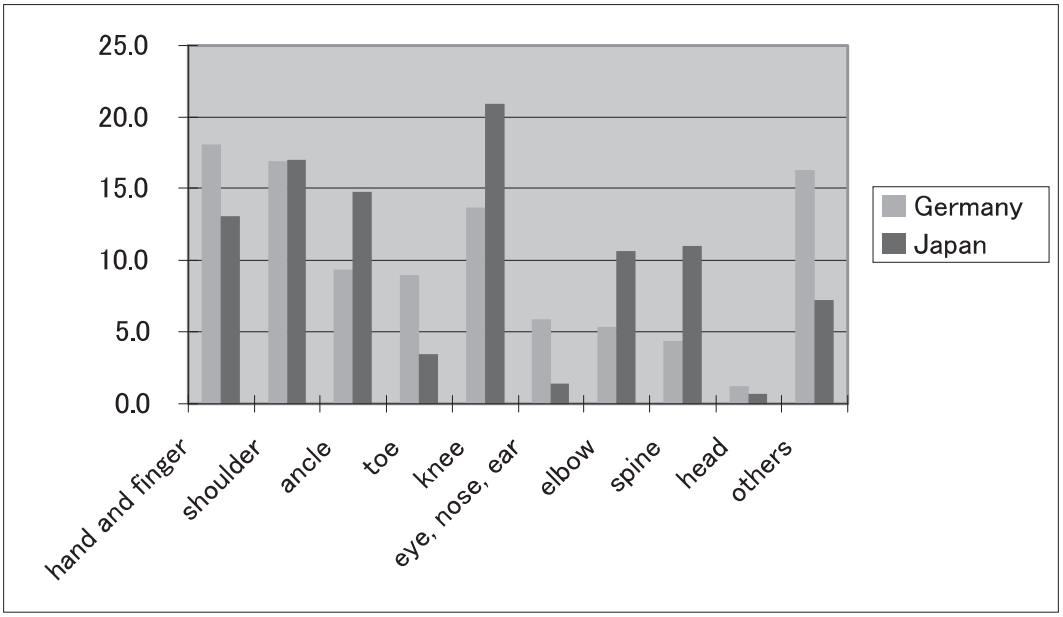

Fig. 1. Injury location (%)
図 1.　ケガの箇所（%）

Type of injury:

Capsule and ligament injuries were most common in both countries followed by dislocations. 12.7% of all injuries were muscle injuries in Germany whereas only 3.9% were muscle injuries in Japan. The rate of fracture was 2.5% in Germany, whereas it was 14.0% in Japan.

Factors influencing injury rate:

The incidence of injuries by activity was similar in both countries. Most injuries occurred during the sparring form in Judo called Randori (Fig. 2-a and 2-b).

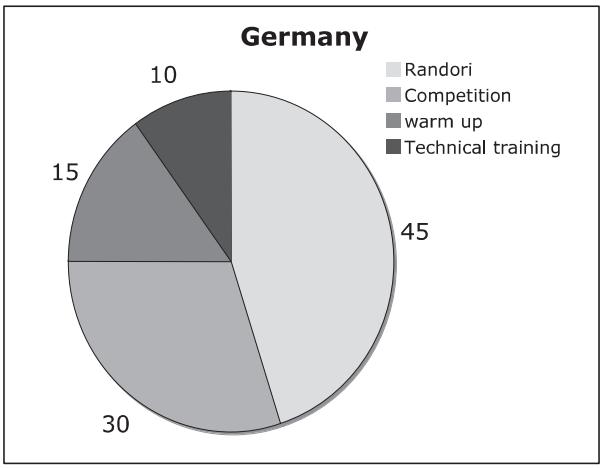

Fig. 2-a. Backuground of injury in % : Germany
図 2-a.: ケガが起こった状況 (%) : ドイツ

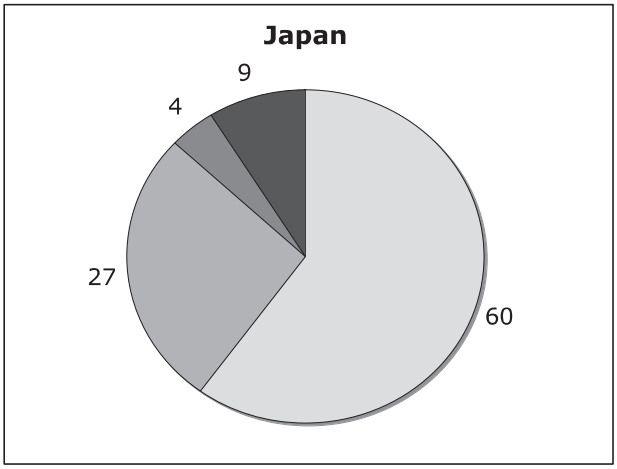

Fig. 2-b. Background of injury in % : Japan
図 2-b. ケガが起こった状況 (%) : 日本

In Japan technical training includes an 9% injury rate during “uchikomi” (repetitive practice of fundamental steps). The remaining injuries (4%) happened during additional exercises such as warm-up or break fall exercises.

In Germany 15% of injuries occurred during so-called “warming up ball games” in which some ball games such as Basketball or soccer are played instead of traditional warming up. 10% of injuries occurred during technical training. Practically no “warming up ball games” are played in Japan.

Injuries in different age groups:

In Germany a lower injury rate was observed for children under 17 years old (Fig. 3).

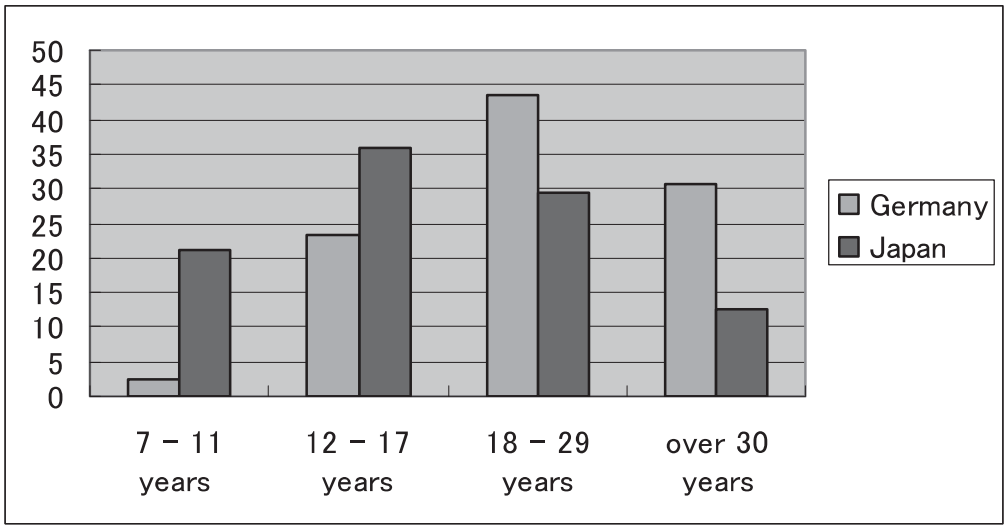

Fig.3. Injury rate in % with respect to the age of athlete (%)
図 3. 年齢別のケガの分布 (%)

Restarting Judo training after injury:

81.2% of German and 70% of Japanese Judo athletes indicated in our questionnaire that they had restarted Judo training without fully recovering from injury.

Chronic pain:

0.3% suffered from chronic muscular pain in Japan whereas in Germany it was 34% (Fig. 4).

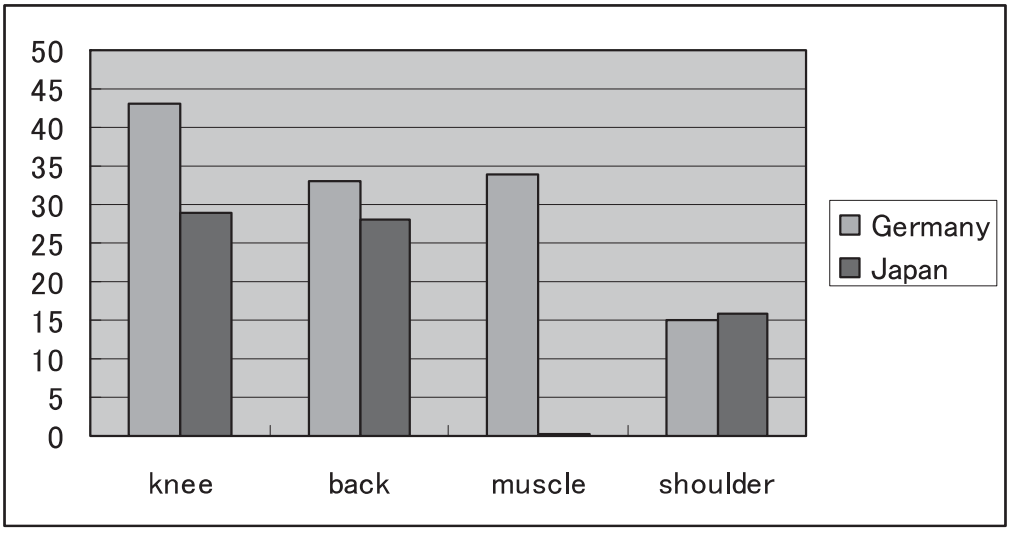

Fig. 4. Chronic pain of adult Judo athletes over 18 years old in percentage (%)
図 4. 18 才以上の柔道家における慢性痛の箇所　(%)

Additional training:

28% of athletes over 12 years old performed stretching in Germany compared with 90% of athletes in Japan. 21% of athletes over 12 years old in Germany performed additional strength training compared with 22% in Japan. That is in Japan about three times as many Judo athletes performed additional stretching as in Germany.

Discussion

This is the first study comparing the style and injury profiles of two different countries. At present about 200,000 Judo athletes are registered with the German Judo Federation. Almost the same number of Judo athletes are registered with the All Japan Judo Federation. A weakness of the study is that the data was not collected for the same time period. The data from Germany is from the mid 90s whereas the Japanese data is from 2007. Despite this, we think that both groups of Judo athletes are representative and comparable because the basis of Judo has not changed, and because of the high number of samples, the comparable number of samples in each age group and the similar distribution of competition levels.

We found that the injury rate is substantially lower in Japan compared to Germany. Japanese

male Judo athletes train 12 hours a week and female athletes 15 hours a week on average. In the German study above we did not study how many hours a week the athletes train in Judo. However, we estimate that Japanese Judo athletes train several times more than German athletes. Assuming that our estimation is correct, it is surprising that the injury rate is much lower in Japan.

Some possible reasons for this are the following: (1) In Germany 15% of the injuries occurred during so called “warming up ball games” such as basketball or soccer. These are played instead of conventional and judo-specific warming up. Judo-specific warming up includs special exercises that are designed to train muscles and movements needed in Judo. In Japan practically no ball games are performed while warming up. (2) More conventional as well as judo-specific warm up are performed in Japan. For example, 90% of Judo athletes practice stretching at every training session in Japan, whereas only 28% do so in Germany. (3) The distribution of our data with regard to age is similar for Germany and Japan. However, we estimate that Japanese athletes train “much more” in terms of the training hours, as mentioned above. This leads to the fact that Japanese Judo athletes are generally more “experienced” than German athletes. This fact might have some contribution to the lower injury rate in Japan. (4) Finally, although this factor falls beyond the scope of this study, we imagine that mental attitude to Judo training could also be playing some role. That is, the goal of judo training in Japan is to perfect one's own technique, whereas the main goal of judo training in other countries is to “win” in competition. The mental attitude of the latter might be causing unnatural application of judo techniques relying too much on muscle power, which in turn causes more injuries. The fact that 34% of German athletes suffer from chronic muscle pain, whereas less than 1% of Japanese athletes suffer from it (Fig. 4), might indicate that German athletes perform Judo using more “muscle power”. The much lower number of muscle injuries in Japan might also be indicative of this (Fig. 1). However, we have to mention here that we cannot exclude the possibility that the higher rate of muscle injury and chronic muscle pain in Germany has a completely different cause, for example social factors that have nothing to do with Judo.

A different injury location in Japan and Germany seems to reflect, at least partly, preferred judo techniques. A rather high percentage of injury occurred during so-called “warming up ball games” in Germany. It is rather questionable whether some ball game can replace a traditional warming up seen from the point of view of sports medicine. What makes the situation worse is that these ball games are usually performed on the judo mat with judo clothes without shoes. In other words, they are performed with improper equipment and in inappropriate circumstances. From an injury prevention point of view, we recommend conventional and judo-specific warming up rather than “warming up ball games”.

The rate of fractures was clearly higher in Japan than in Germany. Additionally children in the group up to 11 had a higher injury rate in Japan. Biologically the ligament insertion is stronger than the bone in children causing fractures to be the typical injury in children(11). Also clavicle fractures through falling are a common injury in young beginners. The increased fracture risk combined with the higher overall injuries in Japan among the younger athletes might indicate

that Judo training in Japan is different and possibly harder for this age group.

The lower injury rate for adults over 30 years old in Japan might be explained by the fact that most of the older judo athletes in Japan are already very experienced with a high standard of technique. More athletes in Germany start later with the sport which might lead to injuries because of the high amount of coordination needed to perform the techniques properly.

Future perspective

Based on the knowledge obtained so far we would like to extend and deepen this study. The intention is to elucidate the correlation of injury and technique, training and combat style in different countries.

Conclusion

- Overall injury rate is lower in Japan.
- Capsule and ligament injuries are most common in both countries.
- Children have a higher injury rate in Japan.
- The rate for muscle injury is 4 times higher in Germany.
- Fracture frequency is doubled in Japan.
- We recommend conventional warm up training instead of ball games.
- Additional stretching could contribute to preventing injury in Judo.

謝辞

本研究にご協力いただきました春日俊先生（立命館大学）、土屋文夫先生（浅見道場）、池永良三先生（大阪市立西高校）、三輪博巳先生（日本航空）、ステファン　ロール氏 (ノルウェー、ウレボール大学病院) に心より感謝申し上げます。

References

(1) Wikipedia, *Judo*, July 2007, <http://en.wikipedia.org/wiki/Judo> (21 June 2008)

(2) Ganschow, R., *Sportverletzungen im Judo: Risikoprofil und Ansätze für die Prävention,* Deutsche Zeitschrift für Sportmedizin 49 (1998) 3, 76

(3) Hamada, H., *Scientific Research on Sports Annual Report 2005*, <http://www.nifs-k.ac.jp/research/kagaku-17/hamadahatu.pdf> (21 June 2008)

(4) Grasmück J., *Verletzungen im Judosport*, Mosebach, U (eds.), Judo in Bewegung. Verlag Dieter Born 2003: 266-280

(5) James, G. and Pieter, W., *Competition Injuries in Young Judo Athletes*, 01 April 2000, <http://www.judoinfo.com/research11.htm> (21 June 2008)

(6) Sterkowicz, S., 06 December 1997, *Body Injuries of Youth Training in Judo*, <http://www.judoinfo.com/research4.htm> (21 June 2008)
(7) Kujala, U. M, Taimela, S., Antti-Poika, I., Orava, S., Tuominen, R., and Myllynen, P., *Acute injuries in soccer, Ice hockey, volleyball, basketball, Judo, and karate: analysis of national registry data*, British Medical Journal 311 (1995) 1465-1648
(8) Pieter, W., Martial Arts Injuries, Caine DJ, Maffulli N (eds): Epidemiology of Pediatric Sports Injuries. Individual Sports. Medicine and Sport Science Basel Karger 48 (2005) 59-73
(9) Ogata, K. and Fukaya, M., *Judo Injuries seen from Accident Reports, Judo Magazine* 7 (2001) 96-98
(10) Medical Committee of All Japan Judo Federation, *Prevention and Countermeasures of Judo injuries*, 11 (1999)
(11) Landin, L., *Epidemiology of children's fractures*, Journal of Pediatric Orthopedics B. April 1997 6 (2) 79-83