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Editorial:

David Jenkins

Ethical challenges in the sports environment: implications for sports therapy:

Paul Robertson

Law changes and injury in Rugby Union:

Richard Morgan

Aikido injuries:

Philip Smith

The occurrence of injuries in ice hockey: an investigation into an English premier league team:

Hannah Boardman

An interview with Kate Cady: Robert Di Leva

Case Study: 15 year old female with Harrington rods:

Brad Hiskins

Book review:

Keith Ward

Book review: Marie Woodward

Editorial

Welcome to the second edition of the Journal of Sports Therapy.

I am particularly pleased to also announce that following the response to our first publication, we are to now publish three issues per calendar year, with this current offering being the spring edition of volume 2 followed, by a summer issue in June, and a third, autumn release in October this year.

It is also encouraging to note that both academic institutions and professional bodies alike have been initially very supportive of what we are trying to achieve with JST, and we will be working hard to further establish and develop as many of these relationships as is possible within, and between, the forthcoming issues. Moreover, whilst we are aware that journals such as JST will always enjoy healthy competition from alternative publications, it is also important to consider that all the most progressive and innovative academic disciplines and professional arenas are those which are served by a number of outlets, which although addressing essentially similar audiences, often do so from different perspectives and with contrasting objectives, but that invariably results in the collective creation of fertile and meaningful fora from which the sectors so served directly benefit from resultant synergistic gains.

As outlined in the spring 2008 editorial, it is our intention to encourage and accommodate contributions from both the academic and professional domains of the sector, and while doing so to also nurture an inter-disciplinary perspective to all our deliberations. Indeed, given the levels, scale and scope of sports therapy, it would be seriously limiting if we did not embrace and engage with all the agents and institutions involved both at the core and periphery of our spheres of influence and operation.

With a special regard to the agents mentioned above, one of JST's main objectives is to actively identify and promote student contributions, especially, although not exclusively, research conducted in the process of writing final-year undergraduate dissertations, and hopefully we will be able to publish an increasing number of papers extracted from these sources in the near future.

Finally, the third edition is now at an advanced planning stage, and contributions to the fourth JST, due out in the early summer, are now being considered. As always please ensure you consult the notes to contributors and editorial details at the back of the current issue.

David Jenkins

In collaboration with Coventry



Ethical challenges in the sports environment: implications for sports therapy.

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The sports environment presents those practicing within it with numerous ethical challenges not often seen in more traditional practice environments. Physiotherapists (Waddington, Roderick & Naik, 2001), sports psychologists (Moore, 2003) and sports coaches (Lyle, 2002) are examples of professions that face these challenges, and it appears that these challenges often result in the athlete's welfare being overlooked (e.g., allowing athletes to play hurt) and arise from sub-cultural practices embedded in sport and, especially at the elite level, the presence of significant financial rewards (Volkwein, 1995). With this in mind, sports therapy, as a developing profession, must take note of these challenges and be prepared to learn from other professions and how they address them.

Ethical guidance, in the first instance, for physiotherapists, sports psychologists and increasingly sports coaches is via the provision of a code of conduct from the professions governing body. This provision of a code by a governing body is characteristic of established professions (Swisher & Page, 2005), however codes offer no guarantee that professionals will act in an ethical manner. For example Waddington and Roderick (2002) highlighted that despite rules being in place to ensure physiotherapists and doctors respect athlete confidentiality, many practitioners in English professional football appear ready to pass on athlete information, with the practitioners relationship with the club often superseding their adherence to a governing bodies code of conduct. Moreover, football clubs employ many physiotherapists and doctors in an informal manner, with the post passed down from a senior practice partner upon retirement or offered by a former playing colleague. Additionally, many practitioners employed in this manner are fans of the club they now work for (Waddington, Roderick & Naik, 2001). This method of employment, despite the presence of a code of conduct, runs the risk of perpetuating sub-cultural practices with clubs not employing, or removing, practitioners who do not wish to engage in these practices (Waddington et al., 2001).

Despite the British Olympic Association (BOA), the British Medical Association (BMA) and the Football Association (FA) emphasising the need for practitioners to maintain confidentiality in the sports environment (Waddington & Roderick, 2002), reiteration of a code of conduct is not going to achieve this or prevent other incidences of unethical practice. Whilst a code may prove "indispensable to the safety net task of catching those who will be unprofessional in their conduct" (McNamee, 1998, p. 167), Kohen (1997, as cited in McNamee, 1998, p. 149) goes further and suggests that professionals should develop and possess a highly internalised sense of responsibility. This is important as mere adherence to a code still leaves scope for unethical practice to take place (Lyle, 2002); requires little or no moral reasoning or understanding, and codes themselves are typically general and lack contextualisation (i.e., do not refer to the sports environment; Sheridan, 2003). Whilst some may argue that such a sense of responsibility as advocated by Kohen cannot be developed the evidence suggests that this is not necessarily the case (Schlabach & Peer, 2008), therefore ethical education beyond the provision of a code of conduct appears necessary.

Whilst some explicit stipulation for ethical education is apparent in several sports therapy undergraduate degree programmes in the United Kingdom this does not appear to be the case for all. If it is indeed the situation that significant ethical education is largely absent from sports therapy education programmes students' preparation for working in the sports environment will be restricted. While it would appear that ethical education would be of benefit to sports therapy students it must be remembered that the aim is not to create ethical scholars but rather to provide students with the ability to make effective decisions in ethically challenging situations (Schlabach & Peer, 2008). In order to make these decisions students must be provided with an awareness of different ethical approaches (e.g., deontological, virtuism), their benefits and flaws, and how they are utilised in the context of sport. In addition, and perhaps most importantly, students should be encouraged to develop an awareness of their own values and how they will always play a part in any decision making process (Lumpkin, Stoll & Beller, 2003). These values will have resulted from students' socialisation in a variety of different environments, and therefore students will have internalised different values and these are notoriously difficult to change and adapt (Green, 2002). Therefore having an awareness of how their values may conflict with a governing body code of conduct or, more worryingly, facilitate an unethical sporting sub-cultural practice is crucial.

Additionally practitioners and students should know how other professionals would react, as third parties, or even practitioners from the same profession, may not operate under the same code or in the same manner (Sherman & Thompson, 2001; Waddinton et al., 2001; Waddington & Roderick, 2002), therefore it should be unambiguous for all from the outset as to how situations will be dealt with. With regard to this Berwick et al (1997) have advocated a single code of conduct for those practicing in the health care sector and such an approach for the sports environment may have potential and provide a code that offers contextualisation and is specific to the sports environment.

However, knowing what other professions may do is not enough. The sports therapy profession and sports therapy educators must be prepared to turn to, and learn from, the literature of more established professions in order to provide practitioners and students with a greater range of approaches to situations than a code of conduct offers. Currently the sports psychology literature appears to offer sound advice on dealing with ethical dilemmas for its practitioners, and careful analysis and adaptation of this to sports therapy may prove beneficial. Educating practitioners with regard to seeking other sources of guidance (e.g., relevant research and legal information) and developing a network of peers (e.g., other sports therapists, physiotherapists) to consult on an uninvolved basis (e.g., consult a peer from a different club or sport) when in challenging situations provides an important adjunct to a code of conduct (Andersen, Van Raalte & Brewer, 2001; British Psychological Society, 2006, p. 8; Hays, 2006; Sherman & Thompson, 2001). These suggestions have the potential to be adapted and applied to sports therapy practice.

In summary, the sports environment presents significant ethical challenges for those practicing within it. Sports therapy, as a developing profession, needs to take heed of other professions and how they are tackling these issues. The current trend for mere provision of a code of conduct, whilst necessary, would appear to be insufficient to ensure ethical practice or to provide practitioners with assistance when faced with challenging situations. Furthermore, practitioners and students should be aware of the nature of the sports environment and the existence of sub-cultural practices and the pressure associated with the presence of financial rewards. Developing practitioners who are well equipped to make appropriate decisions when situations inevitably arise will help to ensure that the growing profession of sports therapy develops a sound reputation amongst other professions working in the sports environment, prevents the perpetuation of unethical behaviours and ensures that athlete welfare remains the paramount concern.

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Law changes and injury in Rugby Union.

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Abstract

Research via a focus group aimed to investigate the perceptions of players, coaches and medical personnel on the experimental law variations and effects they would have on injuries in rugby union. The objectives set out were to define the current interpretation of injury; review and critically evaluate the literature relating to injuries; examine the perceptions on changes in patterns of play; discuss concerns around injuries and the law changes and recommend future areas of research. The findings indicated that contact events are the game event most likely to cause injury, especially the tackle and ruck. The game of rugby union has become faster and more phase dominated, with an emphasis on dominating the opposition in every facet of the game, especially defence. There is disagreement around the effect the experimental law variations will have and particularly the effect at the lower levels of rugby union. There needs to be investigation into the effects of the law changes at these levels of the game as there is no system in place at this present time.

Introduction

Rugby union is a vigorous contact sport, which has one of the highest risk sports for injuries due to the high frequency of contact events (Bottini, 2000). A number of rule changes were imposed by the International Rugby Board (IRB) in 1986 relating to the areas identified as those with highest risk of significant injury (Haylen, 2004). Many of the law changes made since the introduction of professionalism have also been made to present the game as a fast, attractive spectacle, with improved continuity and competitiveness. Whilst aiming to determining the mechanism, site, severity and frequency of injury within the game, many of the studies conducted have raised the question of the effect the law changes may have on the spectrum of injury within the game (Edgar, 1995; Garraway, 1995; Garraway, 2000; Quarrie, 2001). As a consequence, attention has been directed toward the elements carrying the most risk of this type of injury. It is worth noting though, that in terms of time off through injury, it is the less severe, but more common types of injury, such as sprains, strains and dislocations, which cause the most time away from the game. The experimental law variations have the potential to have a massive effect on the very make up of the game and the appearance to the public.

Literature review

Professionalism was adopted within rugby union by the IRB following the second world cup in South Africa in 1995 (Garraway et al, 2005). The inception of professionalism has coincided with an increase in the injury rates in the elite level of the game and a changing tactical approach to the game (Garraway et al, 2000; Silver, 2001). Anecdotal evidence would suggest that the game has become faster and more physical in nature, particularly in the contact phases of the game. There have also been a number of amendments to the laws of the game, both from a safety aspect and also an entertainment value, as the sports governing body attempts to make the game an attractive a spectacle as possible. What is unclear is the effect these law changes and the professional approach teams are taking in preparation and analysis are having on the potential for injury in the game.

Injury is defined as "any injury that prevents a player from taking a full part in all training and match play activities typically planned for that day for a period of greater than 24 hours from midnight at the end of the day the injury was sustained" (Brooks et al 2005a, p757). This definition is succinct in nature which allows for the physical nature of the game, whilst giving a basis to compare inter-study outcomes.

Impact of professionalism on injuries in rugby union

The proportion of players sustaining an injury in rugby union has almost doubled in the professional era, with an injury event every 3.4 matches in the 1993-1994 seasons and a rise to every 2 matches in the 1997-1998 seasons. Brooks et al (2005a) undertook a two season long study involving twelve professional clubs in the English premiership. The results indicated that during a match, contact mechanisms were responsible for 72% of injuries. The ruck and maul elements of the game produced the most injuries for forwards, whilst the tackle resulted in the most injuries for backs.

The tackle is highlighted as an area where many injuries occur in both rugby union and rugby league (Garraway et al, 2000; Brooks et al, 2005; Gabbett and Domrow, 2005). There is support to suggest that rugby union is unique in terms of the frequency of injury compared to rugby league. A significant contributing factor has been shown to be the ruck and maul element, which is not present in other codes of football, such as rugby league. Gabbett and Domrow (2005) identified that within sub-elite rugby league players', injuries were most commonly sustained while being tackled (16.5 injuries per 1000 hrs) and tackling (13.2:1000 hrs). The study also finds that forwards are at a greater risk of contact injury, which is probably due to their increased rate of involvement in tackling and physical collisions.

In relation to contact events in rugby union, Fuller et al (2007) indicated a high contact event (tackle, ruck, and collision) average of 456.8 per game. Tackles caused five times more injuries than any other type of contact event (33.9:1000 player-hours); in addition collisions had a greater propensity to cause injury than other contact events.

Law changes and patterns of play

In comparison to other sports the laws of rugby union have seen the most changes (Thomas, 2005). What the reports suggest is that since the introduction of professionalism, evidence would indicate that the game has become faster and more physical (Eaves and Hughes, 2003). This theory is supported, in part, by the IRB findings of 2007 that the average 'ball in play time' has rose steadily from 31% to 42% during each world cup between 1991 and 2003. With this increase there has consequently been a rise in game related activity (i.e. rucks, mauls, kicking, tackling and passing).

Eaves and Hughes (2003) also support the IRB findings of an increase in game activity. In addition they look a little deeper into the patterns of play. They (ibid) have established that the professional game has seen an increase in the number of rucks which would point toward, in a post professional era, a phase dominated faster game. The most notable increases were in the number of tackles and rucks per game. Hom their research the number of rucks increased four fold since the introduction of professionalism, and though showing an increasing trend already, the number of tackles per game displayed a sharp rise following the inception of professionalism. The marked increase in rucks is consistent with the findings by Eaves and Hughes (2003) and reflects the change in the laws regarding the 'use it or lose it' decree in relation to mauls, which a number of authors found had decreased in number (Eaves and Hughes, 2003; Eaves et al, 2005; Quarrie and Hopkins, 2007).

Experimental Law Variations (ELVs)

Initial law experimentation took place at Stellenbosch University in South Africa in February 2006. The major law changes from a player's perspective cover the following elements; downgrading most penalty offences to free-kicks, allowing handling in the ruck, backs must be at least five metres behind the rear foot at a scrum and permitting defending teams to collapse a rolling maul (Griffiths and Harrington, 2008). Once adopted at a global level the ELVs will remain under review pending a final decision in November 2009. In the meantime, what is the most radical and potentially significant changes to the ethos of the game will continue to undergo significant analysis, including injury surveillance. What is not clear is what the actual effect of these law changes will be on the fabric of the game. There is a clear intention to make the game as attractive as possible with the instigation of these amendments.

Methodology

An exploratory qualitative approach in the form of a focus group was chosen to identify areas of concern within rugby union in relation to law changes. Participants were selected from the fields of coaching, both management level and director of rugby level, medical, which included a rugby football union community doctor and also a current player. Delegates had been involved at a professional level of the game, or from the higher echelons of the amateur status for at least five years.

Key topics based on the literature review, such as 'The effect of law changes on the patterns of play' (Eaves and Hughes, 2003) and 'Injuries in the post professional era' (Garraway and McLeod, 1995; Brooks et al, 2005a), were explored using open ended questions. For example 'How have the law changes impacted on the patterns of play?' Further discussion was encouraged with the use of more directed questions such as 'which phase of play now dominates game strategy'?

The data in this study were analysed manually using a categorization method described by Birley and Moreland (1998) as open coding. The categories used were based on the key topics of discussion, for example 'changes in patterns of play', 'Phases of play responsible for catastrophic injury' and 'changes in player physique'. These categories were then used as a basis of a framework for the discussion.

Findings and discussion

Many of the authors cite the forceful collision aspects of the game as being responsible for the high frequency of injury to the participants (Garraway and McLeod, 1995; Silver, 2001; Brooks et al, 2005a; Fuller et al, 2007). The tackle is the contact event most responsible for time away from the game through injury (Fuller et al, 2007). This overwhelming contribution of the these phases of play to the mechanism of injury could be as a result of law changes, implemented to encourage more open play, which is conducted at higher speeds. The acknowledgement of degree of force as a risk factor is evident in the amendments made to the scrum phase of the game and more specifically the engagement process. The 'crouch-touch-pause-engage' sequence was introduced to reduce the distance between the players and thereby prevent the front rows 'charging in' to disrupt the opposition. The study by Gianotti et al (2008) suggests that this latest amendment is having a beneficial effect, though further work is needed and attention needs to be paid to the other contact elements of the game.

The focus group's opinion was that because of the low frequency of event, it is not possible to be definitive about the reasons for this apparent reduction of catastrophic injury in the scrum. It could be due to the greater control in the engagement phase, but other contributing factors may exist such as a reduction in the number of scrums per game (Quarrie and Hopkins, 2008). This reduction in the number of scrums could be attributed to changes made relating to retaining possession, where a team taking the ball into a maul and being unable to release it, lost possession. This is one of the factors cited in the changes in patterns of play the game is seeing (Williams et al, 2005; Eaves et al, 2005).

Law changes within the game have coincided with changes in the patterns of play. The changes were introduced to improve safety and increase the continuity of the game in response to criticism from the media, spectators and players. Rule changes have resulted in an increase in the overall match time and also the amount of time the ball is in play (Williams et al, 2005), which has raised the demands on the players. One participant backed up the study by Eaves et al (2005) stating:

"The ball prior to the ELVs was in play for about 40 minutes, which is a 30% increase from 10 years ago".

It would also appear that there has been a further increase in the southern hemisphere who are trialling the experimental laws, bringing the total time the ball is in play up to 50 minutes (Quarrie and Hopkins, 2007).

In addition to time, the nature of match activity that a player can expect to be involved in has also changed. Because the game is now more phase dominated (Eaves et al, 2005) as teams focus on keeping possession, the total game activity for a player has increased. As stated in the focus group by a coach involved in the game currently:

"Attacking wide became a bigger thing".

As a result of this changing approach, there has been an increase in the number of rucks coinciding with a decline in the number of mauls and scrums (Eaves and Hughes, 2003). Both of these changes are likely to be related to the introduction of the 'use it or lose it' law, introduced in 1994. The increasing risk of losing possession in the mauls made the option of a ruck more preferable and players being more willing to accept the tackle. This could be one reason for the increasing tackle count in the games along with the increasing amount of time the ball is in play. The development of phase related play, with moves based on repeated rucks places a requirement on the players to engage repeatedly in power based contact phases. As a consequence the stature of the players has increased considerably since 1995 (Quarrie and Hopkins, 2007). As stated in the focus group:

"If you look at the current under 18s' (national side), they are about the same size as the England players in the 1991 world cup".

There are also added factors of improving player conditioning, with decreasing body fat percentage and increasing muscle mass. Players can run faster and in combination with larger mass, create greater momentum to take into the contact situations. This greater body mass confers an advantage in the contact situations this group of players are now finding themselves increasingly involved in, due to the greater momentum generated. With the experimental law of offside from the scrum being five metres back, it will increase the distance between the players and has the potential to result in higher velocity in the collisions. Other influences around this area are the tactical approaches from the coaching departments. One participant relayed that due to the law changes, he felt that teams would just employ what's called a 'drift defence' and attempt to push teams toward the touchline. To counter this, the attacking team in his view:

"...would just look to throw a big player straight at their (oppositions) number 10 or 12 either using our 12, or even a flanker and just smash them through".

This may not just be down to the law changes however. As part of a professional approach in the game teams now analyse virtually every

aspect and look at how to beat defences. The variability in a player's role is illustrated by the comment;

"The game I played years ago, you would never see a back row out in the backs to deliberately punch holes in the defence".

Now it is common practice for a number eight to be used to run at the opposition centre, setting up a mismatch in size with the intent to punch a hole through the defence. The combination of velocity and mass leads to high impact contact events placing a large load on the athletes' bodies.

The group took this on further, with a consensus that there has also been a change in emphasis from attack to defence.

"You didn't previously practice defence, whereas coaches now spend a lot of time working on this element".

A number of delegates felt certain that a critical element is the changing attitude in the tackle. The opinion of the group was that there has been a shift to a more 'offensive tackle' aimed at disrupting the ball carrier. This more aggressive approach would again increase the forces present in this phase of play. This is even more applicable in the higher grades of the game where there are the added factors of increasing player mass and athletic ability, resulting in impacts of a greater force (Silver, 2001).

The deep uncertainty amongst some members of the group is the ability of teams at the lower ends of the game to adapt to this new, phase dominated faster style of play. A current player pointed out:

"As these (law changes) trickle down from the top level, we all try and do it at the lower levels".

What troubled these delegates was that at the lower levels of the game the players may not have the conditioning levels and the skill level necessary to adopt this approach to the game. This does not just relate to the players, but it also encompasses the coaching levels as this influences the quality of preparation players receive. For such a technically demanding sport, coaching quality is important, this is highlighted by the scrum in particular and the number of specialist coaches now in the game (Gianotti et al, 2008). There was an equally enthusiastic level of disagreement around the effect law changes will have at the amateur level, with the view that:

"Don't you think that regardless of level, you will play at the pace which you can cope with for your level"?

This is probably a reasonable assumption and will apply to leagues where teams are all of a similar quality and adopt the same level of commitment to training and tactical analysis. What created a great deal of concern in the focus group and lead to enthusiastic debate, is where there are different strengths of teams within a league, with some teams adopting this 'dominance' in the contact phases and others not doing so. The degree of officiating is also at a different standard in comparison to the professional level of the game. In the professional game there are video cameras, which can be used to cite players for foul play, and referees assistants who are there to support the pitch side official. At this level you have three officials watching the game, whereas at the lower, amateur level there is one official who already has to monitor a large number of events. One of the proposed law variations is to allow teams to pull down a maul. The group agreed with the early indications from the southern hemisphere (Quarrie and Hopkins, 2008) that, allowing this has not caused more injuries, as one delegate pointed out:

"...players are fit enough, they are coached well enough, they know exactly what they are doing and also what the opposition will try and do".

The fear from all of the group was at the lower levels, where because of the deficit in skill and conditioning levels, the maul would 'collapse' rather than be pulled down in a controlled fashion. To counter this varying level of ability, one participant suggested:

"In relation to law makers, they need to recognise that we have two if not three sorts of game. You basically have the upper and lower level and you have rules applying to each level".

This illustrates the problem that the data currently collected is all from the professional level of the game and to extrapolate across to the amateur game that changes made in the elite level will have a similar effect on the amateur level is flawed. Players at the lower end of the game have a different, more social/ recreational based reason for playing the game. Their level and depth of analysis, along with motivation to training, skill level and quality of coaching and officiating will be totally different to that of the elite level.

Conclusions and recommendations

The patterns of play for rugby union have become faster, with more emphasis on ball retention through a phase dominated playing approach. The studies by Eaves and Hughes (2003), Eaves et al (2005) and Williams et al (2005) and views of coaches, doctors and players are in agreement that the game at the elite level has become more of a phase dominated, faster game. The inception of the 'use-it or-lose-it' law has been the major factor behind the more continuous play and the increase in the number of contact events such as the tackle and ruck. The physical stature of the players has developed to reflect the importance of dominating this contact area, further re-enforcing the importance of these aspects of the game. The attitude to the tackle and adoption of a more aggressive/dominating presence in all phases of play has lead to an increase in the force magnitudes in the collision elements of the game.

There is varying opinion as to the effects the experimental law changes will have on injuries. The consensus is that increasing the distance between the players by moving the off side line at the scrum and the nature of the tactics employed to counteract defences has the potential to further increase the velocity in the collision events. It is not clear to what extent these law changes will impact on the amateur levels of the game, but there was concern within the focus group about the transitional levels of the game, which contain teams of varying ability levels.

The difficulty at present is that data is obtained from the elite level of the game and this does not necessarily translate to the amateur level, or from one hemisphere to another. It is not possible to ascertain whether law changes have impacted on injury, because at this time no study has been completed over a long enough period and encompassing all levels which looks at post change results. Further research needs to be conducted into not just the catastrophic injuries, but also the injuries that are the most frequent. With the changing tactical approach and patterns of play the tackle and ruck area will be of particular interest. The frequency of these events and any correlation between a change in the occurrence of these phases and the implementation of the laws need to be investigated. The amateur level has its difficulties as not many teams are prepared to undertake more paperwork or have the financial stability to video games. In the long term interests of the game video analysis may prove more expensive, but more reliable in collating data than questionnaires at the amateur level.

It is not appropriate to assume the effects at the elite level will translate down to the amateur level. Studies need to be in place with sufficient time to gain data on injuries prior to law changes and then run over a period of eight to ten years with analysis conducted at the completion of each season for all levels of the game. Because of the complex, multifactoral nature of the game, this is necessary if it is going to be possible to establish if the outcome of the law change matches its intended purpose.

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Aikido injuries.

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Introduction

Since the 1960s there has been a general increase in practice of all of the Japanese martial arts in the UK and indeed worldwide. This is particularly true of arts such as Judo, Karate and Aikido. This study relates to the latter art which since its introduction to the UK has continued to expand and become an significant part of the British Sports lexicon.

Aikido is a non-competitive martial art devised in the 1930s from Daitoryu ju-jutsu which was formally recognised by the Japanese government in 1948. It is characterised by a series of joint locks and pins, primarily applied to the upper limb, some of which are used to unbalance the opponent and throw them to the ground. Aikido was first introduced into the UK in around 1955 as an offshoot of the growth in Judo by Kenshiro Abbe (Goodbody 1969, Rogers, Ellis & Eastman 2004, Brady 2007).

There are currently approximately 1.5 million practitioners worldwide registered with World Headquarters and its affiliated organisations with an unknown number of "independent" organisations throughout the world. It is practised throughout the world with the two biggest organisations outside of Japan being the USA and France. The UK has currently approximately 9,500 practitioners who are registered with the British Aikido Board; the Sport England recognised governing body (BAB 2008).

Despite this growth in popularity, however, there is little if any information relating to the risks involved in the practice of martial arts in general and Aikido in particular, although traditionally they are considered as high risk activities by the public in general and insurance companies in particular. In addition when talking to any group of Aikido practitioners there are anecdotal reports of numerous training injuries which are almost seen as a rite of passage for many Aikidoka.

Proposal

In order to determine whether there is a high risk of injury in Aikido training it is proposed to study the injury rate amongst a group of Aikido practitioners by means of a questionnaire and to consider the factors involved in producing this rate of injury. The sample will be drawn from the membership of a centre of excellence which gives a wide range of ages, abilities and experience as well as practitioners from both genders.

Aims and objectives of the study

The main aims of the study are:

- 1. To determine the rate of injury amongst a group of Aikido practitioners through a period of twelve months
- 2. To compare this rate with other similar studies
- 3. To determine; where possible; the factors involved in producing this rate of injury

In order to achieve these aims the following objectives will be pursued.

1. An appropriate definition of injury will be sought from the available literature

- 2. A questionnaire will be devised and distributed to participants
- 3. All data returned will be collated according to six main criteria
- Previous similar studies will be reviewed and critically appraised

Rationale for study

Despite these large numbers of practitioners there is little if any research available regarding the risks associated with Aikido practise and a search of Journals through search engines such as Sage, Pubmed and Google Scholar using the terms Aikido and Injury returned no hits for articles directly related to the topic.

In fact the author could find only two directly-related studies, one published in the Aikido Journal (a world-wide newsletter for Aikido) and one unpublished American study. These articles were mainly discussion documents and neither were subjected to statistical analysis as proposed by the author.

Martial arts injury rates have been studied, however, notably in the work of Birrer and Halbrook (1898) who reviewed injuries by sport from the NEISS over a five year period. Other more recent studies have also been published although only one of these (Zetaruk et al, 2005) considers Aikido as a subject of study.

Literature review

As stated above research in the field of Martial arts generally is poor and studies of Aikido injuries virtually non-existent. The only two studies which the author has been able to locate are those of Rosen (2002) and Shishida (1988). These studies both considered the injury rate in Aikido but also suffered from some flaws in relation to the determination of an overall injury rate within the art.

To take the earliest study first: Shishida (1988) reviewed reports in newspapers and other publications in order to report the occurrence of injuries on a case by case basis and draw up the table attached to this document. This however may well have led to under-reporting of the true rate since only injuries which are either the subject of a court case, disciplinary hearing or major insurance claim would be included.

Rosen (2002) followed a similar approach to that proposed by the author but in this case conducted the survey via an internet based questionnaire which considered knee injuries only; showing an overall rate of between 4.45% and 6.9%. There was a disparity between genders (men 5.46%, women 6.72%) but factors such as age, rank and frequency of practice were not considered.

For a more general approach the author turned to data obtained from other martial arts including the "new" combat sport termed as mixed martial arts, which is alternatively known as "cage fighting" or no holds barred fighting.

Once again evidence was somewhat sparse although with the growth of martial arts practice in the UK over the past two to three decades there is more interest in this field.

Evidence from the National Electronic Injury Surveillance System (NEISS) in 1998 suggests that there were 7,071 injuries which resulted

in attendance at emergency rooms amongst martial artists in the 15-24 year age group; 30.6% of all such admissions. This contrasts with data from Australia. Pappas (2007) compared the rate in martial arts (including wrestling) to that of boxing again using NEISS data in this case from the period 2002 - 2005. This showed that in general martial arts had 50% less injuries than boxing although mixed martial arts showed an increase of 65% when compared with boxing. Buse (2006) reviewed 642 mixed martial arts contests over a 10 year period and concluded that the proportion of matches stopped because of blunt head trauma exceeded that documented in other studies of combat sports.

If wrestling is used as a comparison then a recent survey of injuries in American Collegiate sport may also have some relevance in that Hootman et al (2007) showed a rate of 26.4 injuries per 1000 athlete exposures in male US Collegiate wrestling using data from the period 1988 - 2004.

Another comparison may well be made with Judo, and a study conducted by Green et al (2006) showed a 13.5% injury rate amongst judoka although in competition only as a whole.

Perhaps the most relevant is that by Zetaruk et al (2005) which compares Aikido with four other martial arts (Tae Kwon Do, Shotokan Karate, Kung Fu and Tai Chi) and shows a 51% injury rate for Aikido practitioners over one year. Like the author this study also considered the age, sex, length of practice and frequency of practice (but not rank) of practitioners in each style and to certain extent the author is seeking to replicate this study, albeit with a more narrow focus.

Methodology

Using information taken from registrations in the period January to December 2007 a questionnaire was distributed to all adult (18+) members of Ren Shin Kan Aikido Club based in the West Midlands. Established in 1968 Ren Shin Kan is a centre of excellence for Aikido in the UK having probably the highest number of Yudansha (black belt practitioners) of 4th Dan or above in the UK (Ranks in Aikido are roughly comparable to those in other martial arts going from novice (not ranked) to 8th Dan) which allows for a spread of ability, experience and age. Since Aikido is a mixed activity with both genders training together both male and female participants can be considered in the same survey.

Returned questionnaires will be collated and comparisons made between injuries recorded over the period January to December 2007 and the following factors both singly and as a whole.

Factors for comparison are:

- 1. Gender
- 2. Age
- Rank
- 4. Length of practice
- 5. Frequency of practice (hours per week)
- 6. Area of injury

Since there is an ethos of continued practice/participation during injury a definition of injury needs to be achieved so that minor cuts, abrasions and contusions are excluded from the survey whilst significant injuries such as muscle tears, soft tissue haematoma etc. are included. Therefore for the purposes of this study an injury is defined as any event which caused the participant to either withdraw from a session completely or to not attend a planned session or sessions.

Questionnaires along with participation information, informed consent forms and self-addressed envelopes for return of completed paperwork were distributed in January 2008 with a return date in early March 2008. Data was then be collated and analysed by the author.

Inclusion - exclusion criteria for participants

All active members of Ren Shin Kan were included in the study provided that:

- 1. They have been practising Aikido at Ren Shin Kan for at least one year
- 2. Their membership is current
- 3. They are over 18 years of age
- 4. They agree to participate in the study

If all members agreed to participate and respond this gives approximately 85 possible participants in the study and this gives ample scope for refusals and/or non-returns of questionnaires whilst still enabling adequate statistical analysis.

Results

46 questionnaires (n=46) were returned from the sample group of 85 giving a response rate of 54%. Of these, four had missing or incomplete data meaning that analysis was only possible in 42 cases, or 49% of the originally anticipated sample.

Mean age of participants was 42.48 (SD = 11.97) years ranging from 24 to 63 years, with 37 (88%) of the participants being male.

Mean rank was 2nd Dan with a range from zero (4.8%) to 6th Dan (7.1%) and length of training was on average 17.62 years (SD = 10.75) with a range from 1 to 40 years.

There were a total of 23 participants injured during the survey with four participants having two injuries and two participants three injuries respectively (31 injuries in total). Thus the relative risk of injury was 54.8% for the group as a whole and this led to an average of 0.88 weeks of missed training (SD = 1.38) with a range from 0 to 4 weeks; bearing in mind that by definition at least one session was missed in order for the injury to be included in this study.

Comparative data

Injury rates were compared according to the following participant characteristics:

Gender Age Grade (Rank) Hours practised per week Total years practiced

Gender

37 of the 42 participants (88.1%) were male and 5 female (11.9%).

Male participants suffered 26 injuries i.e. 84% of all injuries whilst the 5 female participants suffered 5 injuries i.e. 16% of the total. This results in relative injury rates of .70 and 1 respectively meaning that theoretically there is a 30% greater risk to females during Aikido practice.

Age

Mean age of the participants was 42.48 (SD = 11.97) years ranging from 24 to 63 years and injury rates appeared to spread relatively evenly across all age groups (Figure 1)



Pearson co-efficient of correlation was 0.332 which shows no significant relationship between age and injury.

Grade (Rank)

There was a wide spread of ranks amongst the participants, from no rank (n = 2) to 6th Dan (n = 3) with the most frequent rank being 2nd Dan (n = 10). Once again there was no significant correlation between rank and injury with Pearson correlation = 0.141 (see figure 2)



Frequency of practice

Participants trained for a mean of 6 hours per week (SD = 2.66) ranging from 2 to 14 hours.



Although there is a stronger correlation shown than in the preceding categories (r = 0.388) it still remains weak and not significant.

Total years practiced

Length of training was on average 17.62 years (SD = 10.75) with a range from 1 year (n = 2) to 40 years (n = 3) with peaks at 10 (n = 4) and 25 years (n = 4) respectively.



As before the correlation shown (r = 0.388) remains weak and not significant.

Area of injury

Injuries were reported in the following nine areas; head; neck; shoulder; elbow; wrist/hand; back; hip; knee; ankle/foot. The main area of injury was the ankle with 9 injuries in total (one being a re-injury) or 34.6% of all injuries, this was followed by shoulder (n = 4) and hip (n = 3) injuries with 15.4% and 11.5% respectively



Figure 4: frequency of injury according to area.

Conclusions

Hom this study it appears that there is no significant correlation between any of the various factors and rates of injury. One interesting finding is that the ankle is the most frequent site of injury which contradicts anecdotal evidence from participants that the knee and upper limb are the main injury sites. This does, however, reflect studies in other sports such as basketball, where Leanderson *et al* (1993) and DeHaven and Lintner (1986) showed the ankle to be the most frequently injured site in all sports.

It would appear that females face a 30% greater risk of injury compared to males but this finding cannot be considered reliable due to the small numbers of female participants although again the study by DeHaven and Lintner (1986) supported the notion of increased risk for females in all sports.

There were some weaknesses in the study which should be highlighted, however. Injuries were self-reported and had no third party involvement either in terms of diagnosis or treatment. Also there was no assessment of the participants general health (they were all assumed to be in good health due to their participation) previous injury history or level of physical fitness.

At least the study points the way to further research in the area which may lead to a better understanding of the pattern of injury in what is considered a high-risk activity.

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The occurrence of injuries in ice hockey: an investigation into an English premier league team.

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Introduction

The origins of ice hockey are yet to be confirmed, and the exact date of the games birth is often debated. One thing however which is often confirmed by researchers is that as Vaughan (1999) suggests ice hockey is the fastest and most exciting winter game in the world.

It is a fast paced game which involves both finesse and controlled aggression, which high puck velocities, aggressive stick use and collisions being as part of the game as scoring goals it can only be assumed that injuries are of frequent occurrence.

This investigation looks into the occurrence of injuries in ice hockey, and will pay particular attention to the English game. The hope is to create a specified point in the data, allowing for the development of further research in the area of English ice hockey which appears to have been ignored for some time. At first glance it appears that much of the present research lacks validity, reliability and relevance to this specific area, and it is apparent that research in this area is essential in creating preventative strategies to aid in the development of the game which has been recorded by the Cassidy Coventry Blaze as the fastest growing spectator sport in the United Kingdom (UK).

Methodology

Both primary and secondary research has been collated in order to investigate the occurrence of injuries in ice hockey, initially starting with a look at the existing evidence. Secondary research is of utmost importance in an investigation like this as it provides an opportunity of "reanalysing data that has already been collected for some other purpose". (Saunders et al. 2003, p.188) In doing so data can be used as originally collected or extracted and analysed for a new purpose. Secondary research collected in this case was 'documentary research' including books, journals, and internet sources. (Saunders et al. 2003)

The secondary research collected initially indicates a distinct lack of recent research with some articles or data being recorded as early as the end of the Second World War. The most recent research utilised data collected from the 2004/05 season, but even this was prior to the recent stricter rule enforcement generated by the International Ice Hockey Federation (IIHF) and nicknamed by fans according the The Hockey Forum (2007) as zero-tolerance. The research presently available also has its relativity questioned as none of the articles investigated contained data regarding English or British teams/players. Thus highlighting the demand for primary research to be employed.

In this situation the primary research that was carried out looked at the occurrence of injuries from within one English Premier League (EPL) ice hockey team. The EPL is the second tier hockey league within the UK and consists of 12 teams. (EIHA 2007) During the period that the research was carried out the teams within this league compete for three items of silverware; the league, cup, and the play-offs. During the 2006/07 season the team in question finished third from bottom in the league, and did not make the cup or the play-offs, they have subsequently folded thus ceasing to participate at this level. The creation of the modern EPL followed the demise of the British National League (BNL) which in turn led to an increase in the number of teams and quality of players. The number of non-English Ice Hockey Association (EIHA) trained players dropped from 8 in the BNL to 4 in the EPL creating more competition for the roster spots and raising the standard of play. The injuries recorded were taken from data collected form the 2006/07 season, and were documented from the beginning of the season to the end of the calendar year. Limitation of the study was required due to time restraints on access to the players, and in order for the data to be collated and analysed.

To increase the validity of the data amassed the first two games of the season were excluded to rule out any pre-season injuries. Data was collected over a period of 15 weeks and included 26 games, and 26 training sessions resulting in a total of 52 contact points. This team in particular train twice a week for a period of an hour, and generally play two games a week, one at home and one away. The majority of players also participate in addition off-ice training. In England the season runs from September to March excluding the play-offs where only the top eight teams in the league are invited to participate.

The sample of players used was the team selected as recorded on the team roster on the first day of the season. Subsequent signings or releases were excluded. The sample included 18 players from varying positions, consisting of eight defensemen, ten forwards, and two netminders from an age range of 18 to 28 - years - old. The sample included both EIHA and non-EIHA trained players, with all four of the non-EIHA trained players being native to Eastern Europe, this would appear anecdotically according to interviews with players, coaches and fans to reflect the majority of teams competing in this league.

Injuries that were included in the study were those that caused a player to miss all or part of a game or training session.

Data was collected via a table containing the names and positions of the players, against the games played or training sessions attended. The chart also recorded how many training sessions or games that a player missed as a direct result of the injury received. Any injury that was assessed or required treatment by the team sports therapist were included in the study. As all injuries were assessed by the team sports therapist it ruled out any differentiation in the knowledge, ability or experience of the person(s) reporting the injuries, thus increasing the reliability of the data.

By the end, the number of participants had decreased to 16, leaving 5 defencemen, 9 forwards and 2 netminders. Reasons for the decrease in population of the study include long term suspension as a result of an assault of an official, and transfer to another team.

Literature review

Ice hockey is a fast-paced game involving finesse and controlled aggression with some players skating faster than 25mph, unleashing shots around the 90mph to 100mph; it seems inevitable that injuries will occur. (Daly et al. 1990; Cardiff Devils 2006; Musashi 2006)

There have been many articles written regarding injuries within the sport of ice hockey, and the secondary research collated resides in two main areas; that of data collected in from players competing in the North American/Canadian leagues, and that utilising data from players competing in the European leagues mainly the Swedish and Finnish leagues.

The majority of the studies which were discovered were located in the

journals with the data being collected after the regeneration of ice hockey after the Second World War and up until the 2005/06 season. Many of the articles followed the same methodology (Flik et al. 2005; Emery & Meeuwisse 2001; Molsa et al. 2000) of studying an ice hockey team over a set period of time and recording the injuries that occurred. This research was normally carried out by an off-ice official with the main differences between the studies being the length of time that they were continued over. These studies are in stark contrast to studies such as the one completed by Wennburg and Tator (2003) which were completed by evaluating the injuries that were reported by the media. This difference in methodology made them difficult to compare as the reliability of the Wennburg and Tator (2003) is questionable as the teams in question may not disclose all the injuries suffered by the players to the media. An alternative methodology used was by the study compiled by Hagel et al. (2006) who recorded the numbers of players admitted to the accident and emergency departments, again the results could be questionable as players may not always seek medical advice, or may play for a team with its own medical support staff. It also seems more likely that minor injuries such as strains/sprains would not require medical treatment from an emergency department, in comparison to the more sever injuries such as concussions.

Throughout all the secondary research, differing standards of play were considered, from junior and recreational players through to professional National Hockey League (NHL) players; with large amounts of the research taking place with junior players, this relates to the primary research carried out according to the official team website.

None of the articles located investigated the injury rates in English or British ice hockey players within the UK, even though there are several leagues and a national team. According to the EIHA (2007) the number of teams within the UK has risen to 257, with over 8,000 licensed players and coaches. It also appears slightly surprising of the lack of research as in it's past the UK has gained great success with Drackett (1987) stating that ice hockey is of British decent and according to Crawford (2007) Great Britain was the first nation to win the triple crown containing the Olympics, World Championships and the European Championships.

Although many articles were located regarding players from the North American/Canadian leagues many of these articles lacked specificity to injury occurrence, and the age of many of the articles lower their validity, as every year the rules are evaluated and sometimes changes are made for example the introduction of visors on helmets and neckguards. The lack of specific research regarding injuries seems surprising Boden (2005 pp. 445-54) even goes as far as to state that "ice hockey has the highest incidence of catastrophic injuries for sport in which males participate".

At first glance it appears much of the European research has more relevance to this project than the North American/Canadian research primarily because all of the non-EIHA trained players in the team used are from Eastern Europe; with the team possessing two Slovaks, a Lithuanian and a Pole. It is also thought anecdotally by players and coaches alike that the European style of play is becoming more apparent in English/British game which could be as a direct result of the increase in use of Eastern European players within the EPL. According to each of the 12 EPL teams official website there are a recorded 57 non-EIHA players registered on the rosters. Fig.1. shows this non-EIHA trained player representation with 24 of the players coming from Eastern Europe, 15 coming from Slovakia alone (26%). This increase is thought to be largely due to the wage difference between those of Eastern European dissent in comparison to the more expensive North Americans, Canadians and Western European counterparts. Another reason behind this increase could be as a result of the increase in member countries to the European Union (EU) meaning that there is no requirement for them to obtain work-permits. According to Ice Hockey UK (2007) no players requiring work permits are allowed to play for the EPL.

The rink size in the UK also correlates with the European rink sizes



Figure 1: Player representation

with the exception of the Isle of Wight, which links furthermore the study compiled by Wennburg (2005) which found that there was significant inverse correlation between rink size and collision rates, and found that the use of larger rinks could reduce the risk of injury. The IIHA (2006) states that a rink should be a maximum of 61m by 30m and a minimum of 56m by 26m.

The validity of all previous research was brought into question following the introduction of a new enforcement of the rules. The International Ice Hockey Federation (IIHF) President Rene Fasel (2006) stated that "the 2006-2007 season will be one of the most important in many years in international ice hockey. It is the season where stricter rule enforcement is in place from day one". These changes in rule enforcement have been nicknamed by UK hockey fans according to The Hockey Forum (2007) as 'Zero-Tolerance'. It is though that these rule changes have been brought in to improve the speed of the game and to bring an increase in goals, excitement and a reduction in the grabbing and clutching which had been prevalent in the British game. (Basingstoke Bison 2006) However it is thought by many fans that the change in rules has bought about its own problems with players and officials struggles to fully understand the implications leading to long periods and tired players.

The new 'Zero-Tolerance' rules are suppose to bring about a reduction in the number of 'slashes' when a player swings his/her stick hard at the opposition, 'hooks' when a players tries to impede the progress of the opposition by hooking them with their stick, 'cross-checking' when a players holds their stick in both hands and drives the shaft into the opposition, or 'charges' when a player takes more than a few steps to skate into a opposition player, to name just a few techniques. (First Base Sports 2007) This is of obvious significance because as much of the evidence suggests the primary mechanisms of injuries in secondary research was body-checking, followed by stick and puck contact. (Benson & Meeuwisse 2005; Molsa et al. 2003)

It has been considered by authors such as Hostetler et al. (2004) that injury rates have increased in recent times due to the increase in size and change of somato type of the modern day players. According to the Solihull Barons official website (2007) the mean height of a player is 5ft 11ins with a mean weight of 188lbs.

Many of the authors researched agree with Daly et al. (1990) that "injuries are related to direct trauma (80%) and overuse (20%)". It would seem apparent that research within this area is significant in identifying injury patterns, and will therefore help to bring about preventative strategies.

With many of the articles that were located for this research project being recorded many seasons ago, the relevance to today's modern game must be questionable, the adaptation of new rules, new equipment, new styles of play and different sizes and somato types of players to coincide with this. It could be presumed that the injuries that occur would be different today than 10 years ago.

Discussion

It has been reported by McIntosh and McCrory (2005) that any sport involving body contact projectiles and/or high speeds is associated with injuries, thus making ice hockey a sport involving high risks injury. Whiting and Zernicke (1998) found that in many cases musculoskeletal injuries occur as a result of one object on another coinciding with the primary research that found impacts being the major cause of the injuries recorded as shown in Fig.2.



Figure 2: Mechanism of injury.

It was found that 66% of all injuries recorded were as a direct result of an impact whether from a stick, puck, skate or opposition player, these figures can be supported by Daly et al. (1990).



Figure 3: Impact injuries.

As it is shown in Fig.3. the majority of the collision injuries where a result of impact with either the opposition (42%) or the puck (42%). The puck has been known to reach speeds of 200kmph (Groger 2001) therefore it is not surprising that it can cause vast amount of damage. These results are echoed across many of the articles located in the secondary research. (Daly et al. 1990; Flik et al. 2005; Juhn 2002; Molsa et al. 2000) Weinburg (2004) even went as far as to suggest that body impact or collision is the main risk factor underlying all sports related concussion.

It was found during the primary research that the head/face were the areas of the body most frequently injured in ice hockey, followed closely by shoulder, trunk and upper leg as shown in Fig.4. This results are different to previous studies compiled including the studies by Biasca et al. (1995) and Flik et al. (2005) whom both found that the most common injury was damage to the medical collateral ligament, however even this is in comparison to the study by Molsa et al. (2003) which found upper extremity injuries the most common. Leaving this area opening to debate, however these differences could highlight the differences between the North American/Canadian style of play and the European, or even the implication of the 'Zero-Tolerance' enforcement.



Figure 4: Occurrence of injuries in relation to body part.

Concussion was the most common single injury during the study as shown in Fig.5. these results relate to the much earlier study of Castaldi (1991) who acknowledged that prior to 1975 craniofacial injuries were the most frequent of all ice hockey injuries, and it would have been though that these findings would have be changed drastically due to the introduction of different protective equipment, and associated rules. Controversially Rampton et al. (1997) reported that the risk of receiving a craniofacial injury was the same whilst wearing a half visor (Perspex shield covering half the face) as wearing no facial protection at all. During the primary research craniofacial injuries included a broken nose as a result of impact from a butt end, lacerations from either contact with the puck, player visor, or skate blade, and 5 concussions, although none of the player included in the study play without a half visor. Out of all the secondary research craniofacial injuries were most commonly reported by Rampton et al. (1997) which was the study conducted through emergency department admissions, this is most likely to be as a result of stitches being required or the seriousness of a injury like concussion.



Figure 5: Types of injuries.

Also in support of the secondary research compiled by Rampton et al. (1997) regarding the mean age of the injured hockey player being 23.9, the primary research found the age group 18-24 as the most frequently injured, as shown in Fig. 6.

With regards to exposures missed as a result of injury the primary research found that the mean number of exposures missed was 4.2. It appears that the majority of injuries resulted in a missed exposure of approximately 1 or 2. The greatest number of missed exposures was 12 which as a result of a dislocated shoulder.

With the exception of 2 concussions all injuries occurred during a game exposure as opposed to training the majority of secondary research studies also concluded with this including the studies by



Figure 6: Injuries occurring what age of player.

Daly et al. (1990), Flik et al. (2005) and Molsa et al. (2003). In the primary research game exposures accounted to 50% of all exposures, this is in comparison to the Flik et al. (2005) study were game exposures only accounted for 23%.

Controversy also arose with studies including that by Daly et al (1990), Tator et al. (2004) and Groger (2001) finding that the introduction of improved equipment and stricter rule enforcement has reduced the risk of injury. However Biasca et al. (2002) found that the number of cerebral contusion has increased and that this injury risk cannot be eliminated by any kind of equipment. It was however suggested by Murray and Livingstone that maybe this is due to the players adopting a false sense of security when wearing protective equipment thus leading them to taking excessive and unwarranted risks. The risk of gaining a concussion was also found to increase as the standard of play increases. (Honey 1998)



Figure 7: Injuries in relation to rink size.

Another interesting finding in the primary research was that 25% of the injuries occurred on the home ice, in comparison to away ice rinks (75%). There could be many reasons for this including a different size rink, additional nerves, length of journey to the rink, being confined to a small area whilst travelling, or whether it's the first or second game of the weekend. Fig.7. shows that over 70% of injuries occurred on the smaller ice surfaces of the Isle of Wight supporting evidence put forward by Weinburg (2005) who found that the numbers of injuries on small, intermediate, and large ice surfaces were 295, 258 and 222 respectively.

The primary research collected highlighted the defence position as the position most likely to sustain an injury, however many of the previous studies including that by Groger (2001) stated the forward at a higher risk. This difference again could highlight the differences in the style of play. It is also common for teams in both North America/Canada and European to play with 7 or 8 defence, however in the EPL it is often common for a team to play with 5 defence thus increasing the exposure time.

The final finding from the primary research was that the non-EIHA trained players were more commonly injured even though they only accounted 24% of the team. No secondary research was located to support this; however results show that it is 1.5 times more likely for a non-EIHA trained player to be injured. Reasons for this could be that their positions are usually the higher paid, more sought after placing a higher demand on the player to perform, also they tend to have increased ice time, or maybe even that they are more visible threats for the opposition as they are usually the higher scoring, more skilled players within the team.

With it's mix of players from Canada, America, Western and Eastern Europe and coaches from Canada or England in the EPL the influences on the English game must be significant, and it is findings like the ones highlighted in the primary research that indicate a need for further research to be carried out.

Conclusion and recommendations

In conclusion it appears that there is a massive deficit in research concerning English/British ice hockey, in particular with relation to injuries. This research has highlighted some interesting findings regarding differences between English/British hockey and the research carried out in North America, Canada and Western Europe. Unfortunately it will be difficult to ensure that these differences are due to the different style of play and not the introduction of the new 'Zero-Tolerance' rules, as no control group exists. This could however be made clearer with continued research into the area.

There are flaws with the primary research carried out and this could be improved greatly by extending the time scale in which the team was studied, so that it was investigated over the period of a compete season(s), or that the same period was used over a period of years. Another method could have been to investigate the second half of the season and compare the results with the first. This in theory could allow more injuries to occur, thus increasing the reliability of the research. The validity could have been improved by increasing the population size and maybe including more teams from within the EPL.

The clear lack of relevant research in relationship to injuries in ice hockey in the English game must highlight that the comprehensible recommendations must lean towards further research in this area, to enable any form of understanding the risks of the game, or to create preventative strategies.

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An interview with Kate Cady.

Robert Di Leva from JST recently caught up with Kate Cady; one of the first Sports Therapy graduates. Kate has been actively involved in promoting Sport Therapy since graduation, working in the industry now lecturing. Having a wealth of experience working with sports teams, and running a Sport Therapy undergraduate programme at Gloucester University, Kate shares her views on current state of the Sport Therapy industry at a recent university forum.

September 2008

RDL: Kate can you tell me how you got involved in Sport Therapy?

KC: Well, my dad took me to my first football game when I was 11 years of age; and I saw a guy run onto the pitch and that's when I knew that's what I wanted to do. Sport therapy wasn't around then so initially I applied for physiotherapy. My dad found sport therapy on clearing; so I applied for the very first course in Sport Therapy at the university of North London University (now London Metropolitan University. At that time no-one had really heard of Sports Therapy.

RDL: So how have you seen the changes since you graduated?

KC: Oh massive; nobody even knew who we were when we first graduated. Sport therapy was such a new profession then and people were confused about our training. It was about educating people about what we did. In the last few years I have seen it change enormously, there is a lot more opportunities now for students and particularly with state registration coming in, it [the industry] has got more exposure; with people increasing their qualification and we have a lot more people coming out with their Masters degrees which is fantastic

RDL: You mentioned that when you first qualified this perception of similarities between Sport Therapy and Physiotherapy, what would you consider the differences between Sport Therapy and Physiotherapy?

KC: We [Sports Therapists] are far better at the sports specific examination and assessment and we are fantastic at the sports specific rehabilitation so all the functional stuff about getting an athlete back to sport, that's where we excel. We are really good at the prehabilitation, so working with sports people seeing regular injuries and "saying right, how can we look at ways at preventing those injuries from happening?". We are good at recovery and looking at ways athletes recover from sport using a variety of techniques, as well as being very good at the pitch-side things like acute trauma and management.

RDL: Do you think the provision of health care needs for athletes is adequate?

KC: No (laughs), to be honest. Where I work with ice hockey there was limited provision but this has improved greatly over the last couple of years. I've also worked ouite a long time with football and it has only recently starting to shape up, but that's only been since injuries to John Terry and Peter Czech. There is also a need for Sports Therapists to work with those athletes that have been discharged from hospital after major operations or road traffic accidents so that they are able to get back to playing some sort of sport or take part in exercise.

RDL: Why don't you think the provision of health to athletes are being met?

KC: Money and the health care provision we now have. People also do not understand what a Sports Therapist is, which might have something to do with state registration and that we are not state registered yet so we are not being used fully in sport at the moment. Even though as a Sports Therapist our qualifications are greater than the FA qualifications and the FA diploma, the Sport Therapy degree is not recognised by the Football Association. It's coming over those political hurdles. Another thing is, when you get into teams and you talk through what you do and what you can provide, the teams actually think 'oh yeah, this is for us', but its about getting exposure and getting into those teams, its about getting out there and pushing therapy.

RDL: How do you find the players, management and performance of players respond to having Sport Therapy?

KC: Well I think really good. I've been working in sport for ten seasons now; I've worked in rugby, rugby league, triathlons, football, ice



hockey; the works really. As soon as you go in there, you need to be very professional with how you do things, and clubs respond well to things you want to implement.

RDL: Do you think there needs to be a specific mentoring program within the Sports Therapy industry?

KC: Yes definitely, I mean the Society of Sport Therapist (SST) have a buddy system for diploma students where people from the diploma have contact someone who has already qualified to ask for help but there could be something put in place for those students that have just graduated. I remember when I first graduated the first two years is a complete eye opener and your out there and there's not that many people around and I think its quite nice if our graduates have someone that they can ask or qo to for some advice.

RDL: Where do you see the industry going in ten years?

KC: Well it really depends on when state registration gets in. I mean when we [Sports Therapists] become state registered I think that will start to open doors; therapist can start applying for jobs. A lot depends on the therapist going out there and really promoting being a sports therapist rather than going out there and thinking "oh, I can't get a job, I'll go and get qualified in something else" which I don't think does the degree any benefit. I hope Sports Therapists will start working within the EIS (English Institute of Sport) and have more opportunity to work with teams.

RDL: What are your thoughts on becoming HPC (Health Professional Councils) regulated?

KC: I think it's a good thing, I think it needs to happen with Sport Therapy and I cant wait till it happens to be honest, I' m fed up of people saying ' I'm the same as you, I have a two - -week diploma in Sport Therapy' particularly quite difficult when I have studied for five years.

RDL: Kate thank you very much for your time.

KC: Ok thank you.

Case Study: 15 year old female with Harrington rods.

Brad Hiskins BSc. (Melb. Uni.) Adv Dip Health Science (Soft Tissue Therapy) SMA ACT branch president. Head of Service Soft Tissue Therapy, Beijing Olympic Games.



Figure 1: Without Harrington rods.

A 15 year-old female presented in 2003 with right-sided thoracic pain and discomfort. The pain and discomfort was aggravated with exertional type activities, including soccer, and with prolonged periods of sitting combined with studying for high school exams. The quality and intensity of the pain and discomfort varied. The pain and discomfort intermittently wakes the client from sleep and it was then difficult to fall back to sleep because of the pain and discomfort. The client has described the pain and discomfort as numb, tingling, deep, stabbing, aching and / or tightened.

The client has been under the care of a medical specialist for a marked scoliosis (® side convex) since 2000. The medical specialist recommended the surgical insertion of Harrington Rods to remedy the scoliosis.

The client did not want a surgical intervention.

The client has had various physical treatments in an attempt to alleviate pain and discomfort. The client is ambidextrous and is able to alternate writing between left and right hands to alleviate pain and discomfort, as required. Panadeine Forte and NSAIDS have been used sparingly to treat pain and discomfort.

Assessment demonstrated that trunk flexion, extension, and side flexions had been impacted upon by the thoracic scoliosis. Likewise, thoracic rotation bilaterally, was diminished and cervical extension caused pain and discomfort at the C7-T1 junction.



Figure 2: With Harrington rods.

Shoulder girdle ranges of motion were both restricted to 70% of expected values. Breathing patterns were shallow and the client had difficulty and "restriction" in taking a full, deep breath.

In March, 2004, the client's medical specialist report indicated that the scoliotic curve had increased from 41 degrees to 45 degrees in the previous two years. By December, 2004, the pain and discomfort was becoming "unbearable" at times. The medical specialist again recommended Harrington Rods as treatment.

Treatment focussed on the alleviation of pain and discomfort. Treatments focussed on decreasing muscle tone and improving and / or maintaining spinal joint integrity. The treatments included soft tissue techniques, FFT®, posterior chain strengthening exercises, breathing exercises, and self-management strategies.

The client had Harrington Rods surgical fixed on 5th January, 2006. Soft tissue treatments resumed on the 27th January, 2006.

Treatments initially focussed on desensitising the entire back, particularly the surgical scar sites. Subsequent treatments have focussed on alleviating pain and discomfort at the "bolt sites" (T2-3 and T11-12), at the C7-T1 junction and at the right quadratus lumborum region.

Ongoing treatments aim to allay pain and discomfort and to maintain the remaining mobility of the thorax.

Book Reviews.

DVD Review

Title: Series 1: Neuromuscular System, Volume 4 Practical Techniques of Physiotherapy Examination and Treatment of The Shoulder. Authors: Mark Sexton, Editor; Helen French; Ulrik McCarthy Persson; Karen McCreesh; Jeremy Walsh. Publisher: Clinics In Motion Year: 2006 RRP: €99.00 per volume / €449.00 per series 1 volumes 1-6

Clinics in Motion are a multimedia "innovative learning" publishing company specialising in the production of DVD videos and on-line workbooks to support physiotherapy education and continuing professional development.

The Neuromuscular Series (1-6) features materials designed to support practitioners' knowledge and skill development in the practical techniques of patient examination and treatment. The full series incorporates volumes on the lumbar spine; pelvis and hip; cervical and thoracic spine; shoulder; knee, ankle and foot; wrist and hand. This review will focus on Volume 4: The Shoulder.

For the purchaser, this DVD package is very comprehensive. There are 2 discs, with a combined running time of 8 hours, accompanied by a 54 page colour booklet detailing the contents of the DVDs, suggested learning activities, references and bibliography, a background to the philosophy of Clinics in Motion and an introduction to the presenters, plus a guide to using the DVD content. Additionally, detailed on-line workbooks are downloadable which underpin and build upon the material presented. Purchasers (students and practitioners) can undertake straightforward on-line tests which aim to consolidate understanding and provide acceptable evidence of CPD.

The video material itself is presented extremely effectively. Each DVD has a main menu, featuring chapter titles, which then break down logically into title menus. The structure flows, in terms of progression from examination of the shoulder (surface anatomy; clearing related joints; RoM assessment; overpressure; strength testing; special tests; accessory movements; palpation), treatment (mobilsations and exercise therapy), case studies and clinical findings analysis. There are also a series of short clips entitled "top tips" and "extras". So although the material is presented in a typically clinical fashion, it can easily be viewed by individual chapter or specific topic.

The majority of material is viewable in "multi-angle vision", meaning that footage can be seen clearly from more than one perspective and there is also often a "skeletal view" available. The overall clarity of vision, sound and presentation on this DVD package is to be admired.

This DVD is certainly aimed directly at undergraduate physiotherapists. However, any aspiring manual, massage or sports therapist, osteopath or chiropractor will find it very useful, not least the demonstration of careful clinical patient handling techniques. For sports therapists, there is detailed presentation on such crucial shoulder topics as impingement, instability, rotator cuff injury, thoracic outlet syndrome, labral tears and scapulo-humeral rhythm problems. There is great opportunity for therapists to reaffirm their knowledge of such practical skill in assessing (scapular stability; Neer's test; Hawkins-Kennedy test; sulcus and drawer tests; etc.) and treating (passive mobilsations). Particularly good are the explanations and suggestions for guiding early rehabilitation of shoulder injuries [mobility; proprioception; isometrics; theraband work).

It could be said that there is no material presented here on massage therapy, MET, NMT, manipulations, electro-therapy, heat therapy, cryotherapy, taping or strapping or any of the other common interventions that we may use, but that is simply because they were outside the remit. This is a solid and foundational guide to clinical assessment and manual therapeutic management, superbly put together and backed-up by a very professional organisation.

Keith Ward BSc (Hons) MSST MHFST



Therapeutic Modalities – The Art and Science Authors: Kenneth L. Knight, David O. Draper Publisher: Lippincott, Williams & Wilkins ISBN: 13978-0-7817-5744-7 Pp 399

This textbook discusses the therapeutic modalities available to treat the injured athlete. It reviews the aims and objectives of rehabilitation in a sporting context, and discusses the changes to tissue in response to injury; how it may be recorded, monitored and treated using a wide variety of techniques and modalities.

There are many modalities which are discussed within this text, amongst them manual therapies, such as therapeutic massage and spinal traction which covers guidelines for basic application and procedures; Mechanical therapies, such as ultrasound; Heat and cold therapy; TENS and interferential. Each with detailed information of basic theory and clinical application of the electrotherapy equipment.

The authors have succeeded in sharing complex theories, in a way in which it can be easily grasped and understood. Knight and O'Draper have written succinctly and clearly with a logical progression throughout the chapters. Chapters contain a good range of diagrams and tables. Theories are clearly explained using images and analogies. Common misconceptions are discussed openly to dispel any myths and misunderstandings which many therapists have to contend with. There are a wide variety of examples with a 'five step application procedure' to help with the application of each modality. Case studies relating to therapeutic modalities are included and the text contains critical thinking and review questions in each chapter to help encourage the reader to get the most out of the book. The text contains useful tables which show overviews of all modalities discussed and where they may be appropriately applied.

This text is intended for undergraduates. Due to the layout of the information, it would also be useful for graduates, and practicing therapists to help them revisit and review their theoretical knowledge and to keep abreast of current research in the field.

Highly recommended.

Marie Woodward



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Bender, J., Bloggs, B. and Swistak, P. (1997) 'The evolutionary stability in cooperation', American Political Science Review 91(3): 290-297.

Book

Giddens, A. (1990) The Consequences of Modernity, Cambridge: Polity. Kay, J., Mayer, C. and Thompson, D. (1986) Privatization and Regulation, Oxford:Clarendon Press, pp. 105-129.

Brown, C. (ed.) (1994) Political restructuring in Europe: Ethical Perspectives, London: Routledge.

Chapter in book

Hook, G.D. (1998) 'Japanese Business in Triadic Globalization', in H. Hasegawa and G.D. Hook (eds.) Japanese Business Management: Restructuring for Low Growth and Globalization, London: Routledge, pp. 19-38.

Conference paper

Altenstetter, C. (2001) 'Multi-level implementation networks: The case of medical devices and patient care'; Seventh Biennial Conference of the European Community Studies Association (US), Madison, Wisconsin, 31 May-2 June.

Thesis

Zito, A. (1994) 'Epistemic communities in European policy-making' Ph.D. dissertation, Department of Political Science, University of Pittsburgh.

Newspaper article

Barber, L.(1993) 'The towering bureaucracy', Financial Times, 21 June.

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