

อุบัติการณ์การบาดเจ็บของทีมนักกีฬารักบี้ประเภทผู้เล่น 15 คน มหาวิทยาลัยศรีนครินทรวิโรฒ ในกีฬามหาวิทยาลัยแห่งประเทศไทยครั้งที่ 37 INCIDENCE OF INJURY IN AMATEUR RUGBY FIFTEEN PLAYERS OF SRINAKHARINWIROT UNIVERSITY TEAM IN THE 37TH UNIVERSITY GAME IN THAILAND

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บทคัดย่อ

วัตถุประสงค์ของการศึกษาในครั้งนี้เพื่อศึกษาถึงอุบัติการณ์ ตำแหน่ง และกลไกการบาดเจ็บของทีมนักกีฬารักบี้ประเภท 15 คน ของมหาวิทยาลัยศรีนครินทรวิโรฒ ในกีฬามหาวิทยาลัยแห่งประเทศไทย ครั้งที่ 37 ณ มหาวิทยาลัยธรรมศาสตร์ วิทยาเขตรังสิต จังหวัดปทุมธานี โดยจำนวนนักกีฬาในทีมที่เข้าร่วมการฝึกซ้อม และแข่งขันทั้งสิ้น 30 คน เก็บข้อมูลโดยนักกายภาพบำบัด และผู้ฝึกสอนด้วยแบบสอบถามการบาดเจ็บของนักรักบี้จาก Gabbett TJ (2003) ข้อมูลที่ได้จะทำการเก็บข้อมูลจากช่วงระยะเวลาการฝึกซ้อมและการแข่งขัน และคำนวณเปรียบเทียบกับ 1,000 ชั่วโมงการเล่น ผลการศึกษาพบว่า อุบัติการณ์การบาดเจ็บที่พบในช่วงการแข่งขันเท่ากับ 119.017 ต่อ 1,000 ชั่วโมงการเล่น (Playing hours) (67.45%) และในช่วงฝึกซ้อมเท่ากับ 1.233 ต่อ 1,000 ชั่วโมงการเล่น ตำแหน่งของร่างกายที่ได้รับบาดเจ็บที่พบได้มากที่สุดในการศึกษานี้ ได้แก่ ข้อเท้า และเท้า โดยพบว่า เป็นการบาดเจ็บของกล้ามเนื้อและเอ็นยึดข้อต่อเป็นหลักในทีมผู้เล่นนี้ นอกจากนี้การบาดเจ็บที่พบจะมีมากในช่วงการแข่งขัน การศึกษานี้พบว่าปัจจัยที่มีผลต่อการบาดเจ็บได้แก่การเกิดการล้า การเกิดการบาดเจ็บซ้ำ ด้านอุณหภูมิ สภาพสนามแข่งขัน หรือสนามฝึกซ้อม ประสบการณ์ของผู้เล่น และจำนวนนักกีฬา ต่างมีผลต่ออุบัติการณ์การบาดเจ็บในการแข่งขันและการฝึกซ้อม ซึ่งข้อมูลที่ได้นี้สามารถนำไปประยุกต์ใช้ในการให้การดูแลป้องกันการบาดเจ็บของทีมนักกีฬารักบี้ต่อไป

คำสำคัญ: กายภาพบำบัด การปะทะ ระบาดวิทยา การฝึกซ้อม

Abstract

It was the purpose of this study to investigate the incidence, site, and mechanism of injuries in fifteen amateur rugby players of Srinakharinwirot University team in the 37th University game at Thammasat University, Rangsit Campus, Pathum Thani, Thailand. A total of 30 players from rugby team, Srinakharinwirot University, joined in this game. The data were collected by physical therapists and the head coach by using checklist from Gabbett TJ (2003). All injured data during practice and competition match were recorded. The incidence in competition of injury was 119.017 per 1,000 playing hours (64.45%) and during training was 1.233 per 1,000 playing hours (35.55%). The most common site of injuries was the area of ankle and foot. The sprain and overuse injury were commonly found in this study. The results show that muscular injuries and injuries of the ankle and foot were the most common injury in fifteen rugby players. Furthermore, injuries were found mostly in competition period. These finding suggest that fatigue microtrauma, temperature, athletic experience, number of players and surface of the field may contribute to the injuries of fifteen rugby players of Srinakharinwirot University team. The professional health care and team can apply this data for prevention of rugby players.

Keywords: Physical therapy, Collision, Epidemiology, Training

Introduction

The incidence of injury in rugby football has been reported, which showed the higher rate of injury than other team sports [1-5]. One important reason is the high rate of physical collisions during the game (Gibb et al., 1993). However, the high number of physical impact and the dynamic nature of rugby league, musculoskeletal injuries are extremely common [6]. The high rate of injury incidence catches attention of many researchers. Several studies have documented the incidence of injury in professional rugby league players, semi-professional rugby league players and amateur rugby league players [4-8]. The fatigue is discovered to be the cause of injuries in amateur rugby league players. The most commonly sustained injuries are head and neck [6, 8], while thigh and calf are the highest of injury of semi-professional rugby league [9]. The incidence from previous studies leads the professional health care in the team to

concern, predict and prevent the injury in this sport. The problem after injury may relate to the absence during in training days as well as participation in competition, which are important for athlete and team.

“Training injuries occur more frequently in the earlier stages of the season, while most playing injuries occur in the latter stages of the season” is the take home message from Gabbett in 2003. He found that the intensity of training plays an important role in injury rate in practice period (Gabbett, 2003). Moreover, reduction in pre-season training intensity could reduce training injury rates in rugby league players [10].

Rugby league is an international sport. It has been presented in Thailand for more than 60 years. The rugby tournament of the 37th University game in Thailand was held during 22nd-30th January 2010 at Thammasat University, Rangsit Campus, Pathum Thani

Province. The game is physically demanding, and requires two teams of 15 players, to compete over two 35 minute halves. The sixteen teams from different university in Thailand were participated and divided into 4 groups (Group A to D) Srinakharinwirot University was in group B. Although injury rates of these sport players have been reported in international study, the incidence of injury in amateur rugby in Thailand is unknown. It is possible that differences in body, skill, or violence, injury rates may be different [6, 8]. From physical therapy clinic information, we found several injuries from rugby players. Since the injury is one factor that interfered the absence of training and competition. The best solution to improve performance of sport players is to prevent this factor. Therefore, we would like to investigate the incident of injury in rugby football for further specific training plan for the team.

Objectives

The purpose of this study was to investigate the incidence, and nature of injuries sustained in fifteen amateur rugby players from Srinakharinwirot University over the 37th University game in Thailand.

Methods

The incidence (site, nature, cause and severity of training and competition injuries) was prospectively studied in 37th University game in Thailand (2009). The total number of registered players in Srinakharinwirot University, who are the Srinakharinwirot University

students, team over this period was 30 players. We collected information from one month before and after the tournament. Injury data were collected from four matches, 70 minutes in duration.

Definition of injury:

Since the management in each team is different, we used the method from Gabbett in 2003 to investigate the incident of injury in this study [9]. For the purpose of this study, an injury was defined as a player's pain or disability which occurs during a match or training session. The pain or disability is subsequently assessed by the physical therapist during or immediately following the training session. However, during the match injury was assessed by the head trainer. All injuries sustained during matches and training sessions were recorded by a standardized injury reporting form (Figure 1). Slight modifications were made to the injury reporting form for more convenience.

Classification of injury:

We categorized the relative risk of injury to anatomical sites of the body, mechanism of injury and types of injury similarly to Gabbett's work [9]. For anatomical sites categorization injury is divided into, head and neck, face, abdomen and thorax, shoulder, arm and hand, thigh and calf, knee, ankle and foot, and others categories were the sites selected. Type of injury was determined the temporarily diagnosis, such as, sprain or strain. Finally, mechanism of injury, which is the action or activity that cause of injury, was also distinguished.

Data Analysis

Over the period of study, 4 matches were played and each match lasted 70 minutes in duration. Therefore, the average duration of matches was 4.666 hours. Competition injury exposure was calculated by multiplying the number of players, the match duration, and the number of matches. The overall match injury exposure for all players was 70 playing hours at risk (15 players x 70 minutes x 4 matches). Training injury exposure was calculated by multiplying the number of players, the number of training weeks, the session duration and the number of sessions per week [9]. The overall training injury exposure for all players was 5,470 training hours at risk (30 players x 30 days x 90 minutes / session x 2 sessions/day).

Statistical analysis was performed by using Microsoft Office Excel 2007. A Z-test, utilizing the standard deviation of the study population as a whole, was used to identify significant differences in these data between the training and competitive periods. Statistical significance was accepted if $p < 0.05$.

Results

Over the period (practice and competition) of the 37th University game in Thailand at Thammasat University, Rangsit Campus, Pathum Thani, Thailand, 45 injuries were recorded. An overall incidence of injury of competition was 119.017 per 1,000 playing hours (95% CI, 102.684-135.35) and injury of practice period was 1.233 per 1,000 playing hours (95% CI, -10.866-13.332). In competition and practice, the numbers

of injuries were 29 (64.45%) and 16 (35.55%). New injury was especially observed in this study, 133.299 per 1,000 playing hours (95% CI, 125.666-140.932). The most common site of injury was ankle and foot in competition period (199.948 per 1,000 playing hours) and, knee, ankle and foot in practice period (0.925 per 1,000 playing hours) (Fig 2). Shoulder was the highest risk of injury to the site of the body (28.564 per 1,000 playing hours) in the upper extremity in practice period, but arm and hand were the highest risk of injury to the site of injury (85.692 per 1,000 playing hours) in competition period. From 45 injuries, there was no injury in the part of head, neck, face, arm and hand.

The relative risk of types of injury was presented in the figure 3. The three highest risk in competition period were sprain (157.102 per 1,000 playing hour), overuse injury to muscle or tendon (99.974 per 1,000 playing hour), and bruise and contusion (85.692 per 1,000 playing hour), respectively. Interestingly, sprain was the highest incidence in the practice period (0.925 per 1,000 playing hour). For the relative risk of injury type during for practice open wound / laceration / cut, fracture and contusion did not occur.

Figure 4 shows the mechanism of injury in this study. Overuse was the highest observed (1.295 per 1,000 playing hour) in the practice duration. In competition, the struck by other players (128.538 per 1,000 playing hour), and overuse (114.256 per 1,000 playing hour) were the highest monitoring data.

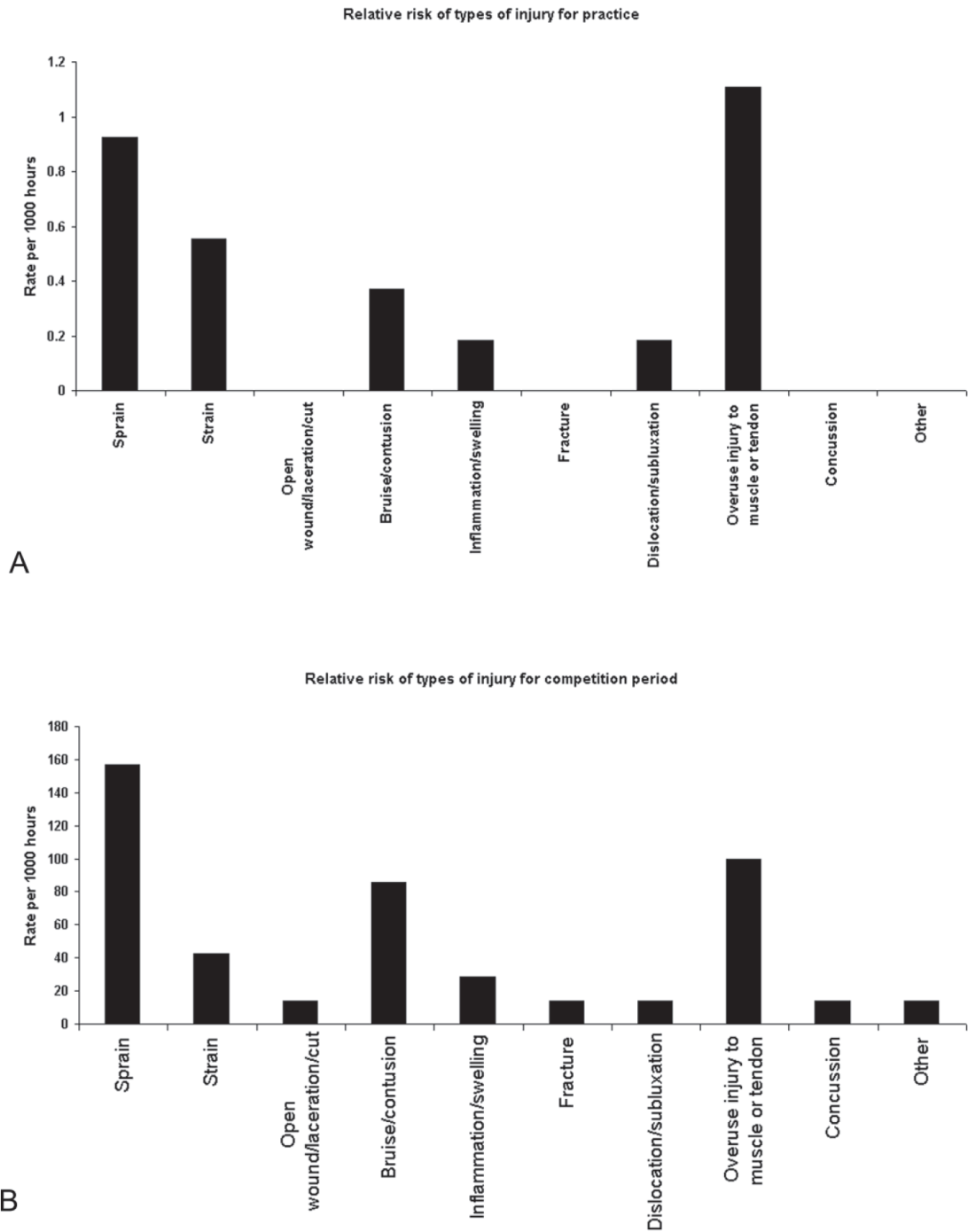
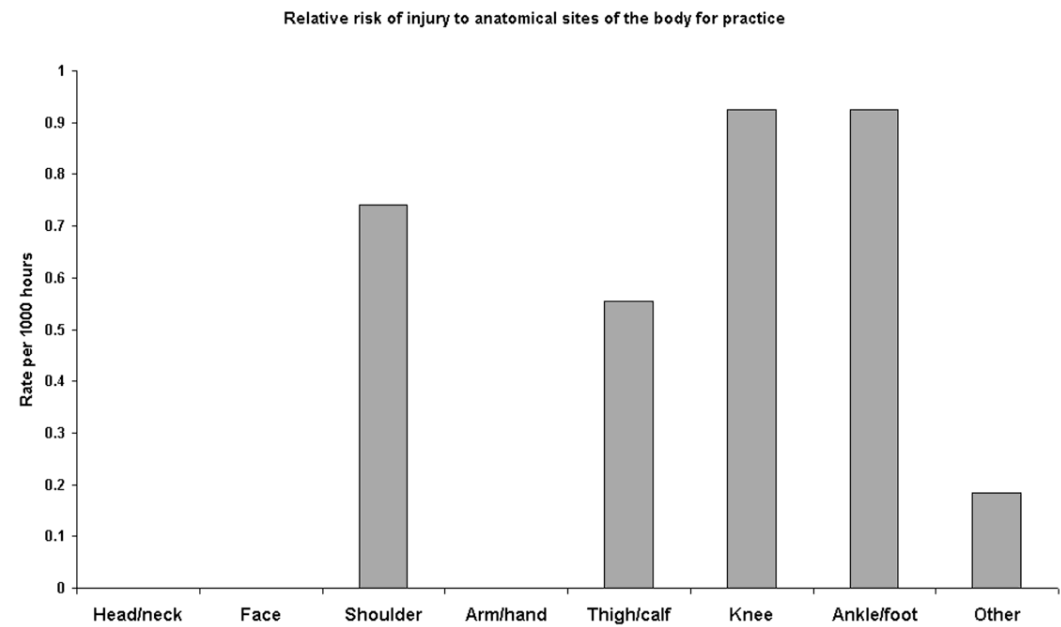
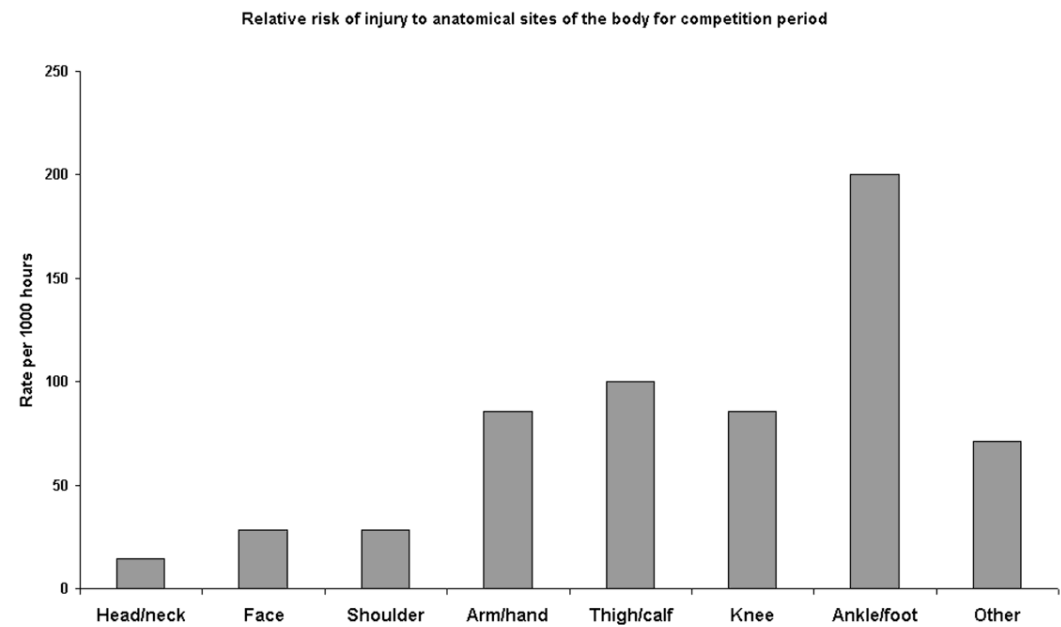


Figure 2 Relative risk of injury to anatomical sites of the body for practice (A) and competition (B), in the 37th University game in Thailand was achieved during 22nd -30th January 2010 at Thammasat University, Rangsit Campus, Pathum Thani.



A



B

Figure 3 Relative risks of types of injury for practice (A) and competition (B), in the 37th University game in Thailand was achieved during 22nd -30th January 2010 at Thammasat University, Rangsit Campus, Pathum Thani.

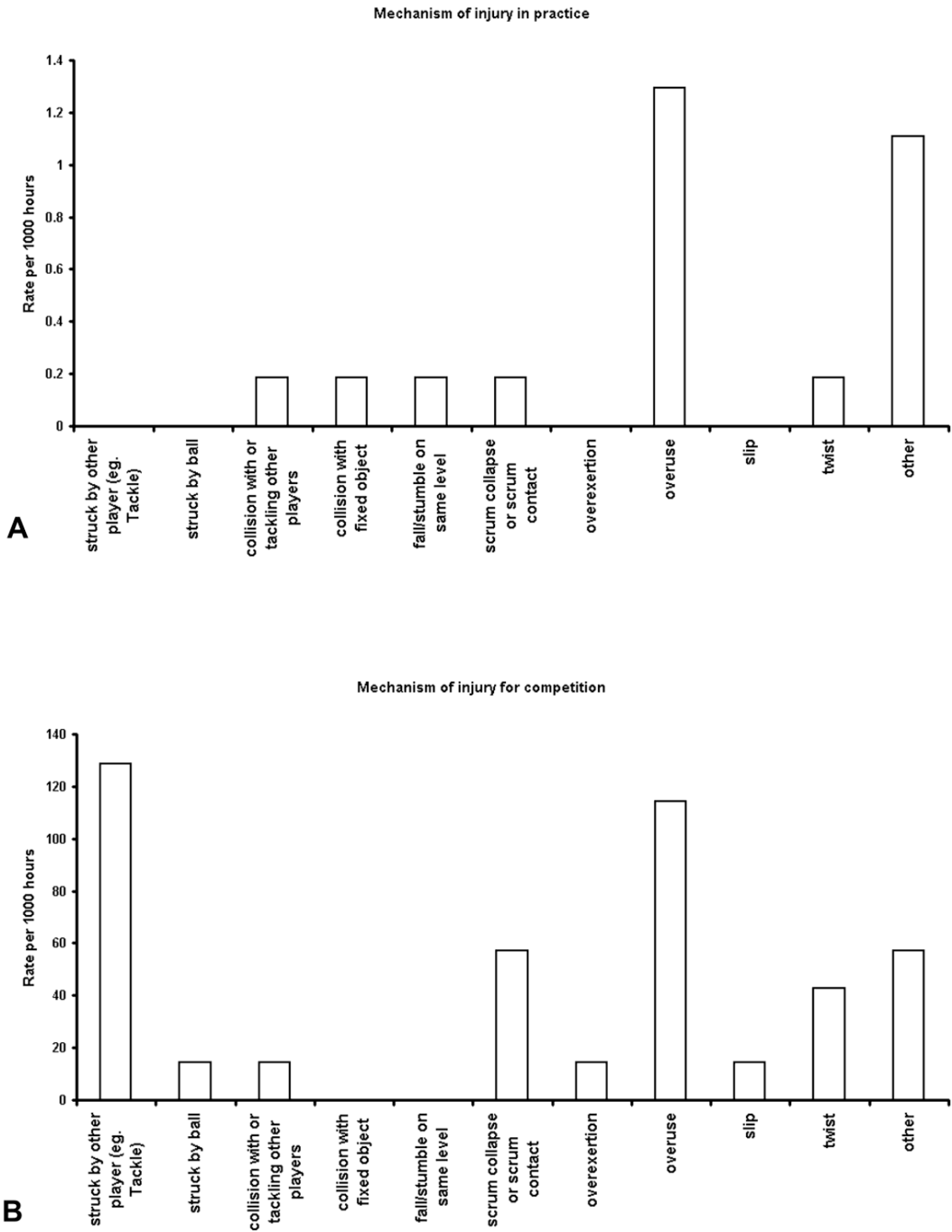


Figure 4 Mechanism of injury in practice (A) and competition (B), in the 37th University game in Thailand was achieved during 22nd -30th January 2010 at Thammasat University, Rangsit Campus, Pathum Thani

Conclusions and Discussion

The purpose of this study was to report the incidence, site, and mechanism of injuries of fifteen amateur rugby players in the 37th University game at Thammasat University, Rangsit Campus, Pathum Thani, Thailand. The results showed that the injury rate of 357.05 per 1,000 playing hours was found in competition and 3.70 per 1,000 playing hours in practice. The injury rate in competition was 13.33% (85.692 per 1,000 playing hour) higher than practice time. The results suggested that the duration of competition period may cause of higher challenge and cause of fatigue and increase the injury rate [6, 10, 11]. The mechanism of fatigue, which induced by the high temperature [12] and work load of the muscles, induces the injury rate might be explained by the fatigue or increase of microtrauma in the soft tissue, or both, which contributed to the injury in these players. In support of this, injury rates of the summer cohort increased in both Australia and British studies [5]. This study was conducted in Thailand, where mean temperature was 26°C (maximum temperature is 30°C and minimum temperature is 23°C) during the practice and competition.

It has been shown that training program of amateur rugby players is dissimilar from one of professional players. Additionally, the endurance training program, which is important for both professional and amateur players, shows better training in first class rugby union [13, 14]. Therefore, the skill and physical performance of players might be the cause of injury in this study. The ability of

the players to correctly perform the technical skills of the game can reduce the risk of injury. In this study, tackle, overuse and scrum were three highest of injury in competition, which is related to previous study [2]. Since the experience of players effect the incidence of injury, it might be consequence to result of this study.

The substitute players in the team are also important for the study of injury rate. In this study, we found that the amateur rugby fifteen players from Srinakharinwirot University had only 30 players and 13.333% of players (4 players) had less experience (lesser than 1 year) in rugby game. Then, the possibility of substitute was less for this team. Therefore, the higher rate of injury in competition might be possible from the number of substitute players that replace the position in the game. This might be one important factor for the fatigue of players and cause of increasing rate of injury in competition time.

The ankle and foot in competition and, knee, ankle and foot in practice time sustained the highest incidence of injury in amateur rugby fifteen players. This is different to previous studies of injuries in professional rugby league and youth amateur rugby players [2, 6, 15]. There are many possible potential confounding factors, such as knee or shoulder, which presented in other studies. However, it might be more successfully prevented for injury than those of the ankle and foot. One interesting complain from players was the field, which is important and can cause of injury to ankle, foot, and knee. The impact forces produced by a hard surface

can cause and overload injury to collagen tissues of the body with single excessive or repeated submaximal impact forces. A degree of friction is required for a player to run, start, stop and make changes to their pattern of movement. This depends on the field surface. In collision sports, injury often arises when a player is tackled with the weight bearing leg fixed to the ground. The degree of rotation friction is thought to cause the risk of injury in such a situation. The uneven or hard surface is one of important factors of injury in practice and competition. This finding was similar to the previous study in American Football injury [16]. The hard surface of field can decrease the shock absorption capacity (Fuller, 1990). Moreover, the different of grass or artificial surfaces have been reported to be the important cause of injury [17].

This study shows that overuse was the highest injury form of fifteen amateur rugby players in the practice and struck by other players and overuse were the most common found in competition period. This finding differs from the previous studies, which presented that muscular injuries (haematomas and stains) were the most incidence of mechanism of injury [6, 18]. Overuse injuries are often the result of repetitive submaximum loading resulting in degeneration change. The chronic or overuse injuries to the foot led to a disproportionate period of absence from practice and competition. This injury occurs when there is not sufficient recovery, when tissue loses their ability to adapt. Many intrinsic and extrinsic factors for the development of ankle

and foot injury in athlete have been report [19]. The foot shape is known to be related rigid to a poor capacity for force attenuation and increased initial peak forces. The varieties of movement such as, cutting, jumping and landing are frequently in rugby. Therefore, the shape of foot related to mechanism of injury is an interesting topic which requires further study.

In order to prepare for training and competition, warm-up and cool-down are suggested for increasing the muscle temperature and range of movement of both joints and musculotendinous units. This is important to prevent injury. The flexibility of soft tissue is also increased from warm-up and cool-down. From the observation, the players spent time for warm-up and cool-down lesser than 40 minutes for each practice and competition. Insufficiency of warm up and cool down possible increase the team's risk of injury. The exercise instruction must include the minimization of musculoskeletal risk. These include provision of a prolonged warm-up and exercise adaptation period and time allowance for sufficient cool-down [20].

In summary, the present study documented the incidence of injury in fifteen amateur rugby players of Srinakharinwirot University team in the 37th University game in Thailand. From our knowledge, this is the first incidence report in amateur rugby fifteen players in Thailand. This study showed the incidence of injury was higher in competition. These findings suggest that fatigue or microtrauma, temperature, experience, number of players and surface of the field may accelerate the onset of fatigue

and cause of injury in rugby fifteen players of Srinakharinwirot University team.

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