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THE INCIDENCE OF INJURIES IN FEMALE ELITE FOOTBALL PLAYERS: A STUDY IN THE THAI WOMEN PREMIER LEAGUE

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ABSTRACT

Introduction: Femal Football is now a popular female team but the number of studies on epidemiologic data of sports injuries of female football players in Thailand is still rather low.

Objective: To determine the injury incidence, and anatomic location of injuries in Thai elite female football players.

Methods: All 6 female football clubs, 146 players (age, 19.96 ± 2.23 years), in the Thai Women Premier League was held during the 2010 season. Retrospective study with a standardized questionnaire design was used for collecting the data of injuries such as type, location, and mechanism of injuries during competition.

Results: A total of 210 injuries occurred in 112 players with an overall injury incidence rate of 6.23 injuries per 1000 player hours. Injury incidence was found high during match play. The thigh and the knee were most commonly injuries region in female players. The majority of injuries were muscle strain and hematoma. The mechanisms of injuries were being tackled, kicked, and collision.

Conclusion: Female elite players had a high injury incidence in both sprain and strain.

We recommend that preventive strategy should be focused on pre-season training design, especially in appropriate stretching techniques, and proper injury management in order to reduce the recurrence rate of incidence in the future.

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KEYWORDS: female, football, injuries, injury types

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INTRODUCTION

Healthy lifestyle, physical active and participate in sports and exercise is an important for every age groups. However, the overuses and acute injuries of sports participation are common found which may causes for permanent disability and dead (Bahr, 2005). The good team performance records need the best performers that play at a full capacity with free from injuries during games and practices at all the times. Health and safety program is a crucial objective for successful team to eliminate and prevent the incidence of accidents and poor health. For professional football team, the intervention programs for keeping all players fit at all matches are an important task for improving team performance in higher ranking (Hawkins, 1996). Football is now a popular female team in Thailand but the number of studies on epidemiologic data for female football players is still rather low. Effective prevention of Thais football injuries needs to be based on an understanding of the nature of the sport, its players and the playing environment. The epidemiology is most common indicated as a population measure rate of injuries per 1000 player-hours. Injury risk should consider both frequency and severity of injury within a context of player exposure time to the sport (Fuller et al., 2008). Moreover, key factors related to injury are situation, age-group or level of play, player position and period of football season (Bahr, 2005).

To prevent injuries in long term, epidemiological information related to injuries is fundamental to create intervention program for preventive strategies. Therefore, the elimination of injury incidence is a one of main purposes for football club planning and management. The fact-based decision about preventive strategies in professional sports, collecting relevant data for comparing with other studies is important for team performance planning (Hawkins & Fuller, 1998). However, many studies have pointed to indicate the risk associated with competitive participation in female football. But have not been reported the incidence, severity, area, type, and mechanism of Asian female football players' injuries at a professional league level.

Therefore, understanding of the incidences and pattern of injuries to Asian female football players is needed (Yoon, 2004). However, many scholars have been variously reports of the incidence of football player injuries (Dvorak, 2000; Inklaar, 1994; McGregor, 1995; Peterson, 2000). But these have not been studied in Asian women elite football players and used the different in research methodology, especially in method to collect the data (Hoy, 1992). So, it is difficult to compare the result of the study for sound planning in football club. Therefore, the purpose of this present study is to determine the incidence, type, location, and mechanisms of injury in elite female football for Thai players.

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METHODS AND SUBJECTS

Participants

A retrospective injury registration study of female football injuries in 6 Thai clubs, they were invited and all accepted to participate in the study. The players were informed in person through team meetings before starting the season and through written document. 146 players (age, 19.96 ± 2.23 years), in the Thai Women Premier League were held during the 2010 season. Data were collected by using standardized record forms and standardized questionnaire (Fuller et al., 2006) collecting the injuries data such as location, mechanisms, types, time, initial treatment consequence and previous history of injuries were recorded and interviewed during training and competitive matches. The researcher strictly adhered to ethical principles in research by collecting data from the player after receiving approval from the Ethics Committee on Research in Human Subjects, Mahidol University (MU-IRB 2012/033.2202). Players were informed and explained the objectives and methods of the study, asked for informed consent, and able to refuse to complete the questionnaire and interviewed. The data collection was confidential and the players were given the opportunity to decline submission of their data. The data disseminated in the form of a summary of research findings and the confidentially of all information was ensured.

Exposure registration

A club representative recorded individual and team playing time, exposure time for all training session, competitive matches and the number of players participating. The drop-outs of the study were also recorded.

Injury registration

Prior to participating in this study, all subjects were informed of the purpose and methods of the informed consent study and completed a questionnaire to record the current injuries status, location, mechanism , types, time of injuries, initial treatment, and history of previous injuries. Injuries rates are primarily dependent upon the definition of injury adopted during the study observation period and methods used to count a number of injuries and to count the population at risk will be influenced on calculating sports injury incidence rate. Therefore, the acute injuries in this study were defined as injuries with any physical complaint associated with a known football trauma, whereas overuse injuries were those with time-loss injuries reporting during the competition period. The three main categories of injuries were classified by their severity (days of absence from full training or match play) that limited sports participation for at least 1 day; minor (1-7 days, moderate (8-21 days), and major (more than 21 days) (Inklarr, 1994). Training exposure was defined as fully participating in all aspects of a training session under the supervision of the team coach. In addition, match

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exposure was defined as participation in a first or reserve team match against a team from a different club (Fuller et al., 2006).

Analysis

All parameters, including incidence rate, severity, location, types, and mechanisms of injuries were analyzed. Continuous data were described as means and SD and percentage or frequency tables were used for describing the categorical data. The incidence rates calculation, the following formula was used: injury incidence rate = (number of injuries/hours of exposure) x 1000 (Chambers, 1979) or calculated in unit of injuries per 1000 player-hours of exposure. The total player exposure hours was computed as 11 players per team x 1.5 hours x number of returned team injury report forms. (Junge A et al., 2004). For incidence rates, 95% confidence interval (CIs) was calculated according to the following formula: 95% CI = incidence± 1.96 x (incidence/square root of number of incidents). The SPSS statistical program version 13.0 for Windows (SPSS Inc., Chicago, IL, USA) was used to calculate the statistics.

RESULTS

Injury Incidence

This study found 112 of 146 players sustained 210 injuries; therefore 77% of players were injured with age 19.96 ± 2.23 years. The overall incidence rate of injuries was 6.23 injuries per 1000 player hours of football exposure, 95% confidence interval, 5.38-7.07 (1.9inj/injured player or 1.4 injuries per registered player). Of these injuries, 38 injuries or 18% were sustained during training (1.28 per 1000 training hours; 95% confidence interval (CI), 0.87-1.68) and 172 injuries or 82% were sustained during match play (43.63 per 1000 match hours; 95% confidence interval (CI), 37.11-50.15). In summary, injury incidence was found high during match play.

Injury Type

Injury type is summarized in fig 1. The most frequent injury types or the majority of the overall injuries were muscle strain (n=57), ligament sprain/injury (n=39) and hematoma (n=39). In match play found injuries in muscle strain, hematoma and ligament sprain and in practice found muscle strain and ligament sprain injuries.

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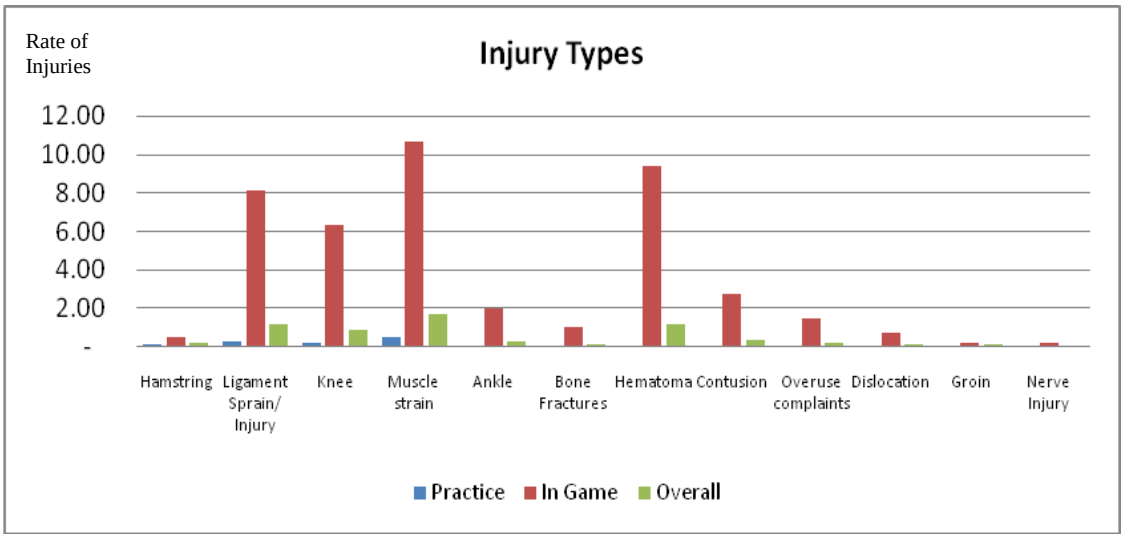

Figure 1 The Incidence Rate of Majority or Types of Injuries

The Mechanisms of Injuries

Figure 2 shows the mechanisms of overall injury rates during the season. There were kicked (n=56), being tackled (n=36), and collision (n=33). In match play found the most injuries such as kicked, being tackled, and collision and in practice found the most injuries such as running, kicked and collision. In match play found overuse injuries more than practice.

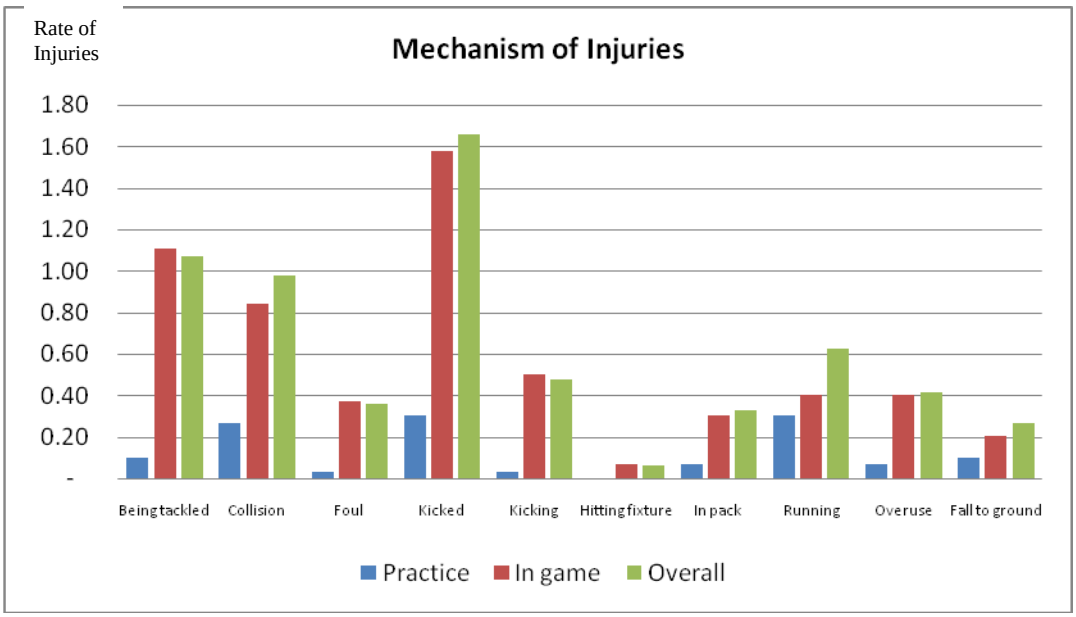

Figure 2 The Incidence Rate of Mechanisms of Injuries The Location of Injury

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Injury location is summarized in fig 3. The most overall injuries in female players (n=170, 81%) were located at lower extremities, concerning mainly the thigh (n=54), the hip/groin (n=46) and the knee (n=36) In match play found the most location were thigh, hip and groin and knee In practice found knee, hip and groin and head and neck.

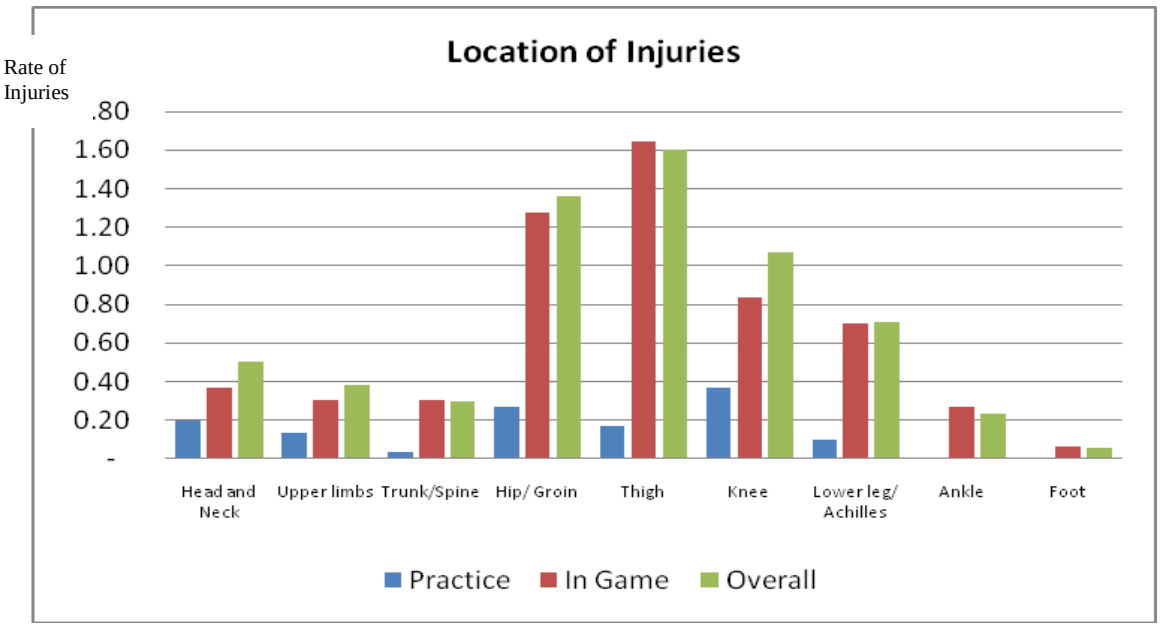

Figure 3 The Incidence Rate of Location or Region of Injuries

DISCUSSION

The present study explored the incidence and characteristics of injuries during Thai premier league held in 2010.

The Incidence of Injury

This study found 210 injuries sustained by 112 players or 76.71% reported. The overall incidence rate of injuries was 6.23 injuries per 1000 player hours of football exposure, 95% confidence interval, 5.38-7.07. Of these injuries, 38 injuries or 18% were sustained during training (1.28 per 1000 training hours; 95% confidence interval (CI), 0.87-1.68) and 172 injuries or 82% were sustained during game play (43.63 per 1000 match hours; 95% confidence interval (CI), 37.11-50.15). The results of this study revealed a high injury incidence rate during match play as well as a comparably low incidence rate during training, although the injuries were not severe. Our finding of the incidence of the practice injury rates in Thai female football tournaments are within the range of the incidence (range 1.2-8.4 per 1000 player hours) reported by other female soccer studies (Le Gall et al, 2008; Faude et al, 2005;Jacobson et al, 2006; Giza et al, 2005; Soderman, 2001; Morgan and Oberlander, 2001).

In comparison with the match injury rates in women's football tournaments, the game incidence rates reported in this study is higher than the range of incidence reported in other studies (range 9.1-24 per 1000 player hours) (Le Gall et al, 2008; Giza et al, 2005; Soderman, 2001; Morgan and Oberlander, 2001;Engstrom, 2001). The incidence rate of injuries during match play in this study was higher than training. Because the exposure time during match play was more intense than training. However, the majority of injuries in this study did not affect the athletes' participation. These findings were consistent with some previous studies that reported the incidence of match injuries in elite female players occurred during the season (Giza et al, 2005; Jacobson and Tiger, 2007) and the studied in team sports of Ekstrand and Nigg (1989) found more injuries during matches than during training. Therefore, for preventive injury, pre-season conditioning by improved period training program, fitness, and skills development may help to reduce the overall incidence rates found in this survey (Heidt, 2000; Junge, 2002; Ekstrand, 1983).

The Types of Injuries

The types of injuries were majority in muscle strain (57 injuries), followed by ligament sprain (39 injuries) and hematoma (39 injuries), respectively. In match play found more muscle strain, hematoma and ligament sprain injuries than during practice. These findings were consistent with some previous studies that reported strain, sprain and contusion were the common diagnoses (Giza et al, 2005; Hawkins and Fuller, 1999). Therefore, these injuries would be occurred in the later training period and the high intensity and duration of training would also affect muscle strain and ligament sprain. High level of muscle strain observed during training increases an importance of implementing effective fitness in training program. Even though, the players had warm-up and stretching for 30 minutes in every training and match play, they found many strains. However, the benefit of warm-up was limited between 15 to 20 minutes after warm-up period.

Although, athletes were trained approximately 3 hours per session. For preventing injury, Ian and Gossal (2000) suggested the role of static stretching as an essential part of fitness programs for preventing either overuse or acute sports injury as a way to decrease the risk of injuries. Similarly, performing slow controlled movements through full range of motion could help to reduce the incidence of injury, dynamic stretching (Prentice, 2003). In addition, Anderson (2006) recommended that increasing the warm up time could also help to prevent injuries. Furthermore, multiple stretching exercises should be included in warm up and down program and done properly to gain the full effects of stretching could reduce the risk of injury (Yessis, 2006). Found overuse complaints in game more than practice argued with Ekstrand (1994) reported that overuse injuries were most often occurred during practice. Theses would be affected by the tasks that have low loads and high frequency over a long period of time. A possible explanation for the relatively low rate of overuse injuries is a longer physical preparation and fitness period (Shawdon & Brukner, 1994).

The Mechanisms or Causes of Injuries

The mechanisms or causes of injuries were found 196 acute injuries and 14 overuse injuries. In match play found more kicked, being tackled, collision, and overuse injuries than during practice. For acute injuries, the mostly mechanisms of injuries in the present study incurred following contact with another players, kicked (56 injuries), being tackled (36 injuries), and collision (33 injuries) as reported previously study for injuries in female football players (Junge and Dvorak, 2007). Attacking and tackling techniques were aggressive behaviors which were the popular and useful activities. Thai female football players usually used these activities to produce advantage in the game for attacking and tackling. Therefore, acute injuries from attacking and tackling behaviors made more severity than other football activities.

To handle the contact nature of the football, the role of pre-season training is not only aimed at fitness development but also at injury prevention by preparing the players better for strength and endurance with a slow progression to ball handling (McKeon, 1989). Thus, to reduce the incidence and consequences of injury due to player-to-player contact addressing the attitude, education of players and club penalties were essential for helping (Hägglund, et al., 2009). The interesting information, foul plays were found during match play (12 injuries) that could also be reflected a lower standard of refereeing in female premier league. Additionally, followed the rules was necessary for the players and more severe penalties from referees for offensive play leading to injury. This could help reduce the risks and severity of injuries causing by foul play (Hägglund, et al., 2009).

The Location or Region of Injuries

The location or region of injuries as reported in this study, mostly injuries (170 injuries, 81%) were located at lower extremities, concerning mainly the thigh (54 injuries), the hip/groin (46 injuries) and the knee (36 injuries). In match play found more high, hip and groin, and knee injuries than during practice. In accordance with other studies on female football athletes, reported a high risk of injury among young female football players were knee injury (Bjordal et al., 1997; Soderman et al., 2001; Giza et al, 2005; Junge, 2006; Benett & Fawcette, 2006) and the hip/groin (Jacobson & Tegner, 2007). For decreasing knee injury rates in female, pre-season neuromuscular training and plyometrics can contribute to prevent the injury incidence.

The data obtained from this study were useful for club administrators, managers, coaches and players who had to make decisions and accept the risk levels within female football.

We suggest that a need for the implementation of specific injury prevention strategy in Thais female football should be focused on pre-season training design involving a number of factors such as physical conditioning, screening and specific training, warm-up/cool down routines, skills development and general safety considerations. In order to reduce incomplete healing process and the recurrence rate of incidence in the

future, finding appropriate stretching techniques, and proper injury management need special attention in sound planning.

Finally, the coach could apply the multiple stretching programs for preventing the risk of injury. Moreover, successful injury prevention required a good cooperation between all various members of the club staff and board of directors and should also involve the regional and national FA's (Hägglund, et al., 2009). Future research on female elite football players' injuries should study the effect of the intervention studies such as 11 plus program for effective evaluation of prevention programs to give valid recommendations for designing sports practice.

Limitation: The key limitation of retrospective study was the injury registration. The player asked to recall injuries for over 8-week period in the past.

CONCLUSION

A preliminary study of the injuries among 112 players elite female football players has shown that the incidence of injury in this study is similar to that found in the existing literature on female football, and that rates during game play are much higher than during practice. Knee injuries were the most common found in this study. Moreover, many overuse injuries and injuries were also found among Thai female football elite players, especially during matches.

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