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Original article

A prospective epidemiological study of injury incidence and injury patterns in a Hong Kong male professional football league during the competitive season

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Abstract

The aim of this study was to investigate the match and training injury incidence, injury patterns and severity, and their monthly variation in a Hong Kong male professional football league. The study design was a prospective cohort study. Seven teams in the Hong Kong Football Association first division league and 152 players from 10 professional teams participated in this study. On a weekly basis throughout the 9-month season, time-loss injuries and individual exposure were collected from injury recorders team visits. Operational injury definitions and procedures followed the recommendations of a football consensus. The overall injury incidence was 7.4 injuries/1000 player hours and 296 injuries were recorded. The relative risk of match injury was 17 times greater than the risk of training injury [relative ratio (RR), 17.3; 95% confidence injury (CI), 11.6−25.7; $p < 0.001$]. Ankle sprain was the most common injury type (16.2% of all injuries) and 52% of these injuries were recurrent. Thigh strain was the second most common injury type with 82% of the injuries involving the hamstring muscle and 80% of hamstring strains were noncontact injuries. During the competitive season, the relative risk of injury was highest in October (RR, 6.8; 95% CI, 6.7−6.9; $p < 0.001$) and February (RR, 4.7; 95% CI, 4.3−5.2; $p < 0.001$). This highlighted that Hong Kong professional football has a high match injury incidence. The relative risk of injury was highest at the beginning of the competitive season. A prospective multicentre epidemiological study is warranted to examine regional differences in injury risks. Coaches, players, health professionals, and researchers should join their efforts to investigate the effect on injury incidence and injury pattern associated with the duration and content of the preseason period, and the number of friendly matches held during preseason.

Keywords: epidemiology; injury patterns; injury risk; male; professional football

Introduction

According to the Fédération Internationale de Football Association (FIFA), 265 million male players actively participate in Association football worldwide and a 21% increase in participation has occurred during the past decade. Despite the popularity of the sport, Association football is associated with a high risk of injury (e.g., the injury incidence in male professional football ranges 8−14.4 injuries per 1000 player hours).[1−5]

Implementing a sports injury surveillance system may be the first step in identifying the injury incidence and patterns, which would then help in developing evidence-based injury prevention measures.[6] A previous study adopted this model and developed a preventive exercise program (e.g., Nordic

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hamstring exercise to reduce the risk of new and recurrent hamstring strain injury in elite soccer players).[7] In the past decade, football injury epidemiological studies have been performed in different parts of the world at the senior male elite level and included leagues in England,[3,4] Sweden,[5] France,[8] Iceland,[9] and Norway,[10,11] and included international tournaments[12–15] and leagues.[1] In a previous epidemiological study,[5] differences in injury risks between Swedish and Danish top leagues were observed. A higher incidence of training injury and match injury was recorded in Danish players (11.8 injuries and 28.2 injuries, respectively, per 1000 player hours), compared to Swedish players (6.0 injuries and 26.2 injuries, respectively, per 1000 player hours). Another regional difference was found at the highest competitive league level.[1] English and Dutch teams showed a significantly higher risk of match injury and major injury, compared to teams from Mediterranean regions (e.g., Spain and France). The frequency of training sessions and matches, playing surface condition and weather, and level of play may contribute to this discrepancy.[5] Data were scarce from other regions such as Africa and Asia. To the knowledge of the authors, only two studies have addressed the risk of injury during play in an Asian league and in a tournament.[14,16] Investigation of the domestic football league in Asia is rare.

This study is the first in Asia to prospectively investigate the incidence of injury and monthly variation in the injury rate in a male domestic football league. This study aims to provide future insight and guidance for clinicians, scientists, and coaches managing football injuries, and to develop specific injury prevention measures for leagues at different competition levels.

Materials and methods

Study period and participants

A prospective study of Hong Kong male professional football players was performed through the 2010–2011 season. All teams were invited, and seven of 10 teams in the first division league—which totalled 152 first team players—participated in this study. These teams had daily soccer training and 1–2 weekly official matches. The competitive season was from September 2010 to May 2011. All procedures in this study were approved by the University Clinical Research Ethical Review Committee of the Chinese University of Hong Kong (Hong Kong, China) and were conducted in accordance with the ethical standards of the Declaration of Helsinki (Reference number: CRE-2010.412).[17]

Data collection

This study design followed the consensus on injury definitions and data collection procedures in studies of football injuries, as outlined by FIFA.[18] Demographic information such as height, weight, and age were collected during the last week of the preseason period (which was before the start of the season). In a briefing session, the definition of injury types and the data collection procedure were explained and introduced to each team before the first official match of the season. Team physicians, coaches, players, and club administrative personnel were invited to participate and all participants provided signed written consent during the session. Injury recorders visited each team on a weekly basis. Individual player exposure for trainings and matches were registered by coaches using a standard exposure form.[19] Injury records were completed by injury recorders using a standardised injury report form. All injury recorders were physiotherapists and athletic trainers and were required to attend a familiarisation session on the report form and the definition of each injury.

Definitions

The operational definitions adopted by this study, which are shown in Table 1, have been widely adopted in football epidemiological studies.[1,2,5,12] All injuries which hinder the player from full participation in training or match play (i.e., time-loss injuries) were recorded. The day on which an injury occurred was Day 0 and was not counted when determining the severity of an injury. The injuries were checked by team physiotherapist or injury recorders for minimal and mild injury cases. Moderate and severe injuries were checked by an orthopaedic specialist and were diagnosed by clinical tests and medical imaging, if necessary. All injuries were followed until the final day of rehabilitation. “Total match exposure” is equal

Table 1
Operational definitions.

Reportable injury	An injury was registered if it occurred during training or match play and if the player was unable to participate in a match or training sessions on the day after the injury (i.e., time-loss) or the player required medical attention. The term “multiple injuries by a single event” is one injury with a multiple diagnosis.
Player	A player was entered into the study if registered by the coach on the club roster to participate in the club's team involvement in the league.
Return to participation	The player was defined as “injured” until he was fully fit to participate in all types of training and matches.
Type of injury	
Acute	Injury with a sudden onset associated with a known trauma that occurred in a sudden manner.
Overuse	Injury with a gradual onset without a known trauma.
Reinjury	Injury of the same type and in the same location it was previously sustained within 2 months (early), 2–12 months (late), or >12 months (delayed).
Severity of injury	
Minimal injuries	Absence from matches and training sessions for 0–3 days.
Mild injuries	Absence from matches and training sessions for 4–7 days.
Moderate injuries	Absence from matches and training sessions for 8–28 days.
Severe injuries	Absence from matches and training sessions for >28 days.
Exposure	Hours of matches and training.
Injury incidence	Number of injuries per 1000 player hours.