

## Management of Football Players Injuries at Dakahlia Governorate "Analytical Study"

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### ABSTRACT

**Background:** No research on the medical specialty of soccer injuries in Egypt, despite its importance for injury prevention designing in a country with restricted football medicine resources. The aim of this study was to evaluate the incidence and pattern of injuries in soccer players.

**Objective:** The aim of this analytical study is to evaluate the incidence, severity and pattern of injuries and follow up of outcome results of the management procedures done for football players at Dakahlia Governorate season 2017-2018.

**Patients and Method:** A prospective study was conducted during season 2017-2018 which a complete of 154 players with associating age vary of 18–35 years. Physiotherapists recorded team exposure and injuries. Participants: Five teams of 2nd Egyptian league at Dakahlia.

**Results:** A total of 350 injuries occurred during season 2017-2018 giving an injury incidence of 9.4 injuries/1,000 hours, on average 31 players per team. The average player participated in  $33 \pm 4$  matches and had  $170 \pm 15$  training sessions each season. Of all included injuries 250 (71.4%) were acute injuries, where as 100 (28.6%) were overuse injuries, with 212 (60.6%) occurring during matches and 138(39.4%) during training. On average, a player sustained 2.3 injuries per season. The single most common injury subtype was hamstring strain, representing 14.8% of all injuries, severe injuries constituted 12%, ankle injuries represent 10.9%, fractures represent 2.8%, dislocations represent 1.7%, ACL injury represent 1.2%, medial meniscal injury represent 2.3% and tendon Achilles rupture represent 0.6%, concussion accounted for 1.7% of all injuries. Re-injuries constituted 9% of all injuries.

**Conclusions:** The overall incidence of injuries among players in Egypt is high because of lack of medical personnel and medical care, lack in documentation of injuries and there is no rules or programs for injury prevention provided by Egyptian Football Association. a lot of studies are required to completely perceive the pattern of injuries and establish prevention programs.

**Keywords:** Football Injuries, Dakahlia Governorate, Sport injuries.

### INTRODUCTION

Football is one of the most popular sports in the world <sup>(1-2)</sup>, as many as about 200 million individuals playing that game, including about 200.000 professional players<sup>(3)</sup>.

The Egyptian Football Association is the governing body of football in Egypt. It was founded in 1921, joined FIFA in 1923. The documented Football player in Egypt around 750,320 players in all ages, genders, degrees all over Egypt<sup>(4)</sup>.

Football players are at a high risk of injuries <sup>(5)</sup>. Every elite male football player is supposed to be exposed to injury at least once in a year, which affects his performance <sup>(2,6)</sup>.

Several classification systems for soccer injuries have been developed <sup>(7)</sup>. When a same type of injury re-affected the player, at the same sites, is considered recurrent<sup>(8)</sup>.

In terms of physical complaint, the injury can be defined as: mild, if the loss of activity day is less than 1 week; moderate, if the rest period ranges between 1 and 4 weeks; and Severe, if the loss of activity day is more than 4 weeks<sup>(9)</sup>.

Therefore, the injury severity is defined according to the number of days of activity lost by the

player. An injury can occur during the match (match exposure), or during the training session<sup>(8)</sup>.

Injuries can be classified by location, type, part of the body interested, and mechanism of injury, such as traumatic or overuse <sup>(8,10)</sup>. The main locations of injuries are: head and neck (head, face, neck, cervical spine), upper limb (shoulder, clavicle, hand/fingers, elbow, wrist), trunk (pelvis/buttock, abdomen, lumbar spine, thorax and chest) and lower limb (hip, groin, thigh, knee, lower leg, ankle, foot and toes) <sup>(11)</sup>.

The main types of injury are: traumatic, such as fracture, contusion or hematoma, laceration, muscle or tendon strain and joint or ligament sprains or overuse injuries <sup>(8)</sup>.

An overuse injury is caused by repeated micro-trauma without a single, identifiable event responsible for the injury. A traumatic injury refers to an injury resulting from a specific, identifiable event<sup>(10)</sup>. Finally, two different circumstances can lead to an injury: contact or non-contact with another player or object <sup>(12)</sup>.

The diagnosis of injuries is based on clinical medicine, fundamentally on symptomatology and especially on the anamnesis of the injury mechanism and physical examination. Imaging studies through

the musculoskeletal echography and magnetic resonance are complementary studies, despite the fact that they could be increasingly more useful when confirming a diagnosis or especially when giving a prognosis<sup>(13, 14)</sup>.

The best way to prevent those injuries is the physical preparation prior to play. The aim of physical training is to improve the physical function of a player, on the other hand, to protect him against injury, or re-injury<sup>(15)</sup>.

According to the van Mechelen model prevention of sports injuries can be seen as a four-step sequence: **In the first step**, the extent of the injury problem is evaluated through injury surveillance. This usually includes describing the incidence, severity, type and location of injury. **In step two**, the risk factors and mechanisms involved in the occurrence of injury are identified. **The third step** is to introduce preventive measures likely to reduce the future risk and/or severity of injuries. **In the final step**, the effects of these measures are evaluated either by repeating step one, or in a randomized controlled trial<sup>(16)</sup>.

Management programs are generally divided into acute care and functional rehabilitation phases. The general goals of acute interventions are to reduce pain and swelling and the general goals of a rehabilitation program are to restore proper range of motion, strength, proprioception and balance, resulting in overall return to pre-injury function and reducing the probability of chronic instability and re-injury<sup>(17)</sup>.

## AIM OF THE WORK

The aim of this analytical study was to evaluate the incidence, severity and pattern of injuries and follow up of outcome results of the management procedures done for football players at Dakahlia Governorate season 2017 -2018.

## MATERIAL AND METHODS

### Study population

The study sample consists of 154 professional male football players aged 20-35 years was studied in the season 2017 – 2018 (August 1, 2017, through July 31, 2018).

Five teams in the second division participate in this study (Bani Ebeid - Mansoura -Meniet Sammanoud – Nabarouh - Sherbien). The study consisted of 16 goalkeepers, 56 defense players, 50 mid-field players and 32 forward players of the Professional Egyptian Football League. These data collected were reported through the supervisors and medical members and files of injury reports.

All players in the five teams were invited to participate in the study.

## Ethical approval:

The study was approved by the medical ethics committee of Al-Azhar University Hospitals and a written informed consent was obtained from all cases.

## Data collection

Because organization is limited and medical staffs are not present, we obtained cooperation from the coaching staff for each team after we explained the research to them. The Egyptian Football Association database includes a roster of all team members, a daily log for all team practices training matches and during a season. In this study we contacted with all players for injury detection by direct and indirect ways and a detailed record of all reportable injuries. Certified team's trainers are responsible for entering data from their teams. However, we contacted the players directly and through social media applications as Face book, what's app, and messenger and by using telephone. All injuries resulting in a player being unable to fully participate in training or match play were recorded, and the player was considered injured until the team medical staff allowed full participation in training and availability for match selection. Injuries were categorized under three degrees of severity based on the number of days absence. All injuries were followed until the final day of rehabilitation.

## Injury Report:

Injury Report included the team name, date of the match, player's name, type and location of injury, mechanism of injury, date of injury, and severity of injury and medical attention and rehabilitation received.

## Inclusion criteria:

- Soccer players with different types of injuries
- Soccer players had the possible following injuries during playing football at match or exercise.
- Age of the patient: older than 18 years to 35 years old.
- The clinical follow up is average 2 years.

## Exclusion criteria:

- Soccer players with injuries for another reason.
- Age below 18 years or older than 35 years
- Soccer players who had previous boney procedure.

## Case Definition:

An overuse injury was defined as a gradual-onset injury caused by repeated micro trauma without a single, identifiable event responsible for the injury.<sup>(10)</sup> An *acute injury* was defined as trauma resulting from a specific and identifiable event.<sup>(10)</sup>

**Type of Overuse Injury:**

Bursitis, deformity or weakness, general stress, impingement, inflammation, joint laxity, stress fracture, tendinitis, or other. <sup>(10-13)</sup>

**Type of Acute Injury:**

Based on the nature of the injury and injury diagnosis, we described acute injuries as follows: blood vessels, dislocation, fracture, internal organ, nerves, open wound, sprain or strain, superficial or contusion, or other. <sup>(9-13)</sup>

**Injury Severity:**

Each injury was classified as *no time lost* if an athlete lost no participation time, *minor* if the athlete lost less than 1 week, *Moderate* if the athlete lost 1 to 3 weeks, or *major* if the athlete lost more than 3 weeks. <sup>(10-13)</sup>

**Statistical Analysis**

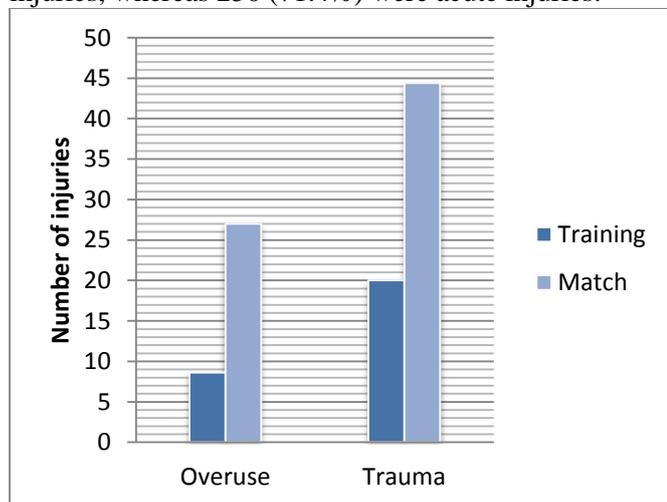
The characteristics of injuries were analyzed and compared by injury mechanism, body region, type of injury, injury frequency by player position, timing of injury and injury severity.

ANOVA was used for group comparisons of continuous normally distributed data. The chi-square test was used for comparison of proportions between groups and for pairwise comparisons. Yates' correction for continuity and the Bon ferroni correction were used for multiple pairwise comparisons. Injury incidence was calculated as the number of injuries per 1,000 player hours. The significance level was set at  $p < 0.05$ . SPSS version 23.0 program for windows was used for data processing.

**RESULTS**

**Numbers of overuse and acute injuries**

A total of 154 injured players reported 350 injuries. Of all included injuries, 100 (28.6%) were overuse injuries, whereas 250 (71.4%) were acute injuries.



**Figure 1: Number of overuse and acute injuries.**

**Exposure:**

Over the entire study period, a total of 37000 hours of exposure (31100 of training and 5900 of match play) were registered over the season.

The average player participated in  $33 \pm 4$  matches and had  $170 \pm 15$  training sessions each season. This resulted in a mean exposure time of  $235 \pm 20$  h, including  $33 \pm 8$  h of match play and  $202 \pm 12$  of **training per player.**

**Etiology of injuries**

The main causes include struck by another person 30% (105), overuse constitute 28.6% (100), collision with a person 15.1% (53), rapid acceleration or deceleration 9.1% (32) and aggravation of a previous injury 8.9% (31) **Table 1:**

**Table (1): The main causes of injuries**

Cause	No	%
Struck by another person	105	30%
Overuse	100	28.6%
Collision with a person	53	15.1%
Rapid acceleration or deceleration	32	9.1%
Aggravation of a previous injury	31	8.9%
Twist or change of direction	11	3.2%
Awkward landing	10	2.8%
Unknown	8	2.3%

**Frequency and nature of injuries**

Among total injuries, 350 of them were registered, with 212 (60.6%) occurring during matches and 138 (39.4%) during training. On average, a player sustained 2.3 injuries per season.

The single most common injury subtype was hamstring strain, representing 14.8% of all injuries. Severe injuries constituted 12%, ankle sprain and fractures and contusion represent 10.9% , fractures represent 2.6%, dislocations represent 1.7%, ACL injury represent 1.2% , medial meniscal injury represent 2.3% and tendon Achilles rupture represent 0.6%, concussion accounted for 1.7% of all injuries. Re-injuries constituted 9% of all injuries.

**Table (2):** Distribution of injuries in different body regions:

	No	%	Mild	Moderate	Severe	
Head	33	9.4%	30	3		
Neck ,cervical spine	3	0.8%	3			
Shoulder	8	2.4%	4	1	3	
Clavicle	5	1.4%	1	1	3	
Upper arm	2	0.6%	2			
Elbow	5	1.4%	3	1	1	
Forearm	3	0.8%	2	1		
Wrist	10	2.9%	5	5		
Hand/finger/thumb	4	1.1 %	4			
Sternum/ribs/upper back	3	0.8%	1	1	1	
Abdomen	10	2.9%	8	1	1	
Lower back/pelvis/ thigh	21	6%	19	1	1	
Thigh muscles	Hamstring	52	14.8%	29	17	6
	Adductor	37	10.6%	23	12	2
	Quadriceps femoris	17	4.9%	13	3	1
Knee	46	13.1%	25	15	6	
Leg ,calf muscles	26	7.5%	15	10	1	
Ankle	38	10.9%	16	14	8	
Tendon achilis, peroneal tendons	6	1.7%		4	2	
Foot,toe	21	6%	13	2	6	

Severe injuries (causing absence of >28 days) accounted for 10.4% of all injuries. The most common subtypes of severe injuries were ankle fractures and sprain (n=18.9%), ACL and medial meniscal injuries (n=14.3%), hamstring strains (n=14.3%) and foot fracture (n=14.3%). The average (mean) team can expect eight severe injuries per season **Table 3**.

**Table (3):** Distribution of severe injuries (42injuries):

	No	%
Ankle fracture and sprain	8	18.9%
Knee joint(ACL)(MM)	6	14.3%
Hamstring strain	6	14.3%
Foot fractures	6	14.3%
Clavicle fracture	3	7.2%
Shoulder dislocation	3	7.2%
Adductor strain	2	4.7%
Tendon Achilles rupture	2	4.7%
Low back pain	1	2.4%
Calf muscle strain	1	2.4%
Quadriceps femoris strain	1	2.4%
Fracture at 5 <sup>th</sup> rib	1	2.4%
Strain of lower abdominal muscles	1	2.4%
Sprain of MCL of elbow	1	2.4%

**Table (4): Distribution of injuries at Head, neck:(36 injuries)**

		No	Type of injury	
Head	Contusions, hematoma and lacerations	9	Mild	
	Cut wounds	18	Mild	
	Contusion Concussion	6	Mild	Moderate
			3	3
Neck,cervical spine	Contusions, hematoma and lacerations	3	Mild	

Head injuries accounted for 9.4% of all injuries. This table incorporates all types of head injuries including concussions but also cut wounds, lacerations and eye injuries.

Over the season, only 6 concussions were registered, representing an incidence of 0.16 concussions/1,000 hours of exposure.

When examining concussion rates, this may be vastly underestimated because the diagnosis of a concussion is dependent on a player volunteering his symptoms to medical personnel.

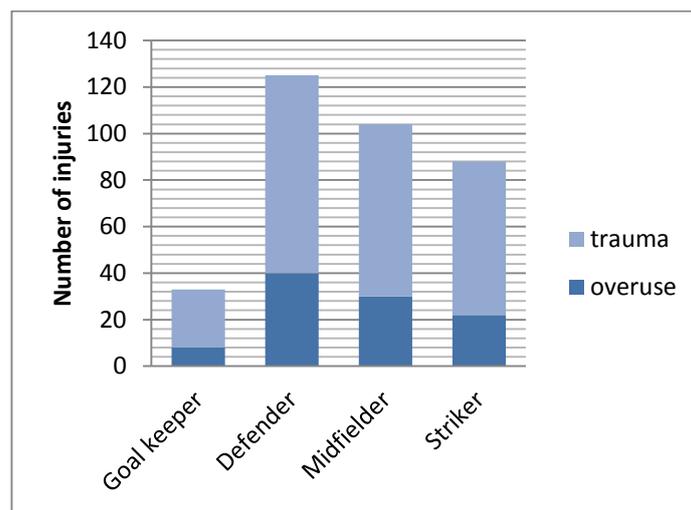
Concussion may involve a graded set of clinical symptoms that may or may not involve loss of consciousness.

Hence, some of the other 27 head injuries sustained by the players in the present study may have led to unrecognized concussive injuries and the incidence may have been underreported.

A worrying finding is that, despite current consensus recommendations to ensure a structured rehabilitation with sufficient physical and cognitive rest following concussion, more than half of the players diagnosed with concussion returned to full training and match availability within one week.

**Injuries in dependency of playing position**

In this study, defenders injuries ( $n=125, 35.7\%$  of all injuries) and midfielders ( $n=104, 29.7\%$ ), followed by strikers ( $n=88, 25.2\%$ ), as well as goalkeepers ( $n=33, 9.4\%$ ) **Figure 2** :



**Figure 2: Distrubution of traumatic and overuse injuries in dependency of playing position**

**Re-injuries**

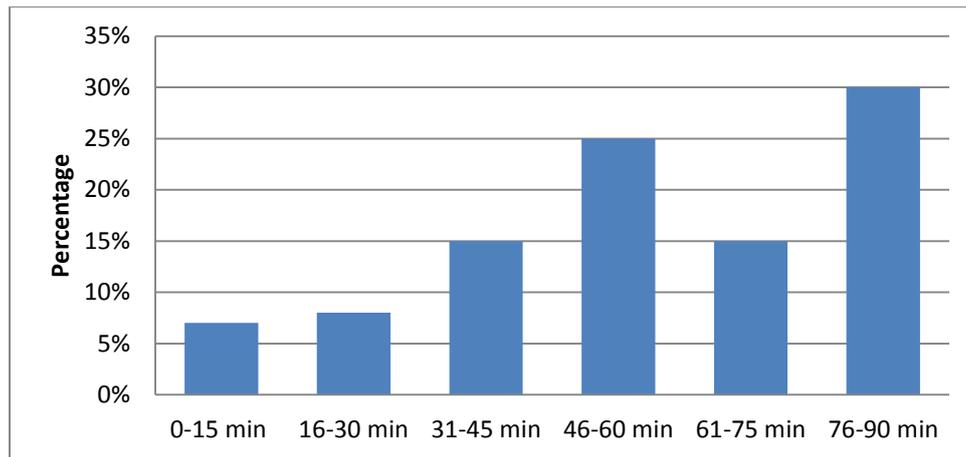
Re-injuries constituted 9% of all injuries. ( $p<0.0001$ ).

**Timing of injury**

Players were about 3 times more likely to be injured within the last half of a match compared with the primary half. the amount of the half wherever players were most in danger was throughout the last 15 min of traditional time and within t\he 15 min immediately after half-time as shown in **Table 5 & Figure 3**:

**Table (5):**

Time of injury	No	%
0-15 min	24	7%
16-30 min	28	8%
31-45 min	53	15%
46-60 min	88	25%
61-75 min	53	15%
76-90 min	104	30%



**Figure 3: Distribution of injuries according to time**

### Variations in injury incidence over a season

Traumatic injuries were additional common throughout the competitive season (Sep to May), whereas overuse injuries peaked throughout the pre-season preparation period in July. The incidence of ankle joint sprains, knee joint injuries was constant over the season. Muscle strains and ligament sprains are the most common injuries during both the pre and competitive seasons.

### Prevention methods recorded:

No clear prevention programs were denoted except general use of player equipment's as shin guard; many players use some protective braces and medical plaster for muscle cramps and tear.

### DISCUSSION

The Egyptian Football Association is the governing body of football in Egypt. It was founded in 1921, joined FIFA in 1923. The documented Football player in Egypt around 750,320 players in all ages, genders, degrees all over Egypt.<sup>(4)</sup>

**In Egypt** football is the most popular sport and to decrease the number of injuries, prevent early retirement, and provide a healthy and safe environment for players, preventive programs are highly recommended. For designing preventive programs, information about the incidence and risk of injury are required.

The aim of this study was to evaluate the incidence, severity and pattern of footballer's injuries and do management of football players injuries at Dakahlia Governorate season 2017 -2018.

The study sample consist of 154 professional male football players aged 20-35 years was studied in the season 2017 – 2018 (August 1, 2017, through July 31, 2018). Five teams in the second division participate in this study (Bani Ebeid - Mansoura -

Meniet Sammanoud – Nabarouh - Sherbien). The study consisted of 16 goalkeepers, 56 defense players, 50 mid-field players and 32 forward players of the Professional Egyptian Football League. All players in the five teams were invited to participate in the study.

Over the entire study period, a total of 37000 hours of exposure (31100 of training and 5900 of match play) were registered over the season. The average player participated in  $33 \pm 4$  matches and had  $170 \pm 15$  training sessions each season. This resulted in a mean exposure time of  $235 \pm 20$  h, including  $33 \pm 8$  h of match play and  $202 \pm 12$  of training per player.

The main causes of injuries include struck by another person 30% (105), overuse constitute 28.6% (100), collision with a person 15.1% (53), rapid acceleration or deceleration 9.1% (32) and aggravation of a previous injury 8.9% (31).

In total, 350 injuries were registered, with 212 (60.6%) occurring during matches and 138 (39.4%) during training. Of all included injuries, 100 (28.6%) were overuse injuries, whereas 250 (71.4%) were acute injuries. On average, a player sustained 2.3 injuries per season. The single most common injury subtype was hamstring strain, representing 14.8% of all injuries, severe injuries constituted 12%, ankle sprain and fractures and contusion represent 10.9%, fractures represent 2.6%, dislocations represent 1.7%, ACL injury represent 1.2%, medial meniscal injury represent 2.3% and tendon Achilles rupture represent 0.6%, concussion accounted for 1.7% of all injuries. Re-injuries constituted 9% of all injuries ( $p < 0.0001$ ).

The injury incidences are consistent with recent data from the Swedish Premier League as well as in England and in Norway. An elite team with 25 players in the squad can expect about 50 injuries each season, but in Egypt we denoted that it was about 70 injuries for every team consists of 31 players.

The great differ we denoted because of many intrinsic risk factors as players fitness, physics, pre matches training, awareness and mentality about telling medicals for management of injuries, also extrinsic risk factors as playing field surfaces, protective equipment's and around natures of weathers.

Hamstring strain was the most common injury, representing 14.8% of all injuries. A team of 30 player can expect about 10 hamstring strains each season. Hamstring injuries occur frequently and are usually treated conservatively. Whereas return to competition following hamstring strains is comparatively fast, a high rate of injury return highlights the importance of targeted rehabilitation and learning.

Knee injuries were the second common severe injuries diagnosed, medial meniscal injury represent 2.3%, anterior cruciate ligament (ACL) injuries were 1.2 % of distribution of all injuries. All of 4 players do anterior cruciate ligament reconstruction 1 player have been retired because they can't able to continue as before injury. While 3 players have been retained to normal activity. Among 4 players 1 player have been retired because lack of qualified medical and rehabilitation programs.

Head injuries accounted for 9.4% of all injuries. This incorporates all types of head injuries including concussions but also cut wounds, lacerations and eye injuries. Over the season, only 6 concussions were registered, representing an incidence of 0.16 concussions/1,000 hours of exposure. When examining concussion rates, this may be vastly underestimated because the diagnosis of a concussion is dependent on a player volunteering his symptoms to medical personnel<sup>(18)</sup>. Concussion may involve a graded set of clinical symptoms that may or may not involve loss of consciousness<sup>(19)</sup>.

Hence, some of the other 27 head injuries sustained by the players in the present study may have led to unrecognized concussive injuries and the incidence may have been underreported. A worrying finding is that, despite current consensus recommendations to ensure a structured rehabilitation with sufficient physical and cognitive rest following concussion, more than half of the players diagnosed with concussion returned to full training and match availability within one week<sup>(20)</sup>.

Severe injuries (causing absence of >28 days) accounted for 10.4% of all injuries. The most common subtypes of severe injuries were ankle fractures and sprain (n=18.9%), ACL and medial meniscal injuries (n=14.3%), hamstring strains (n=14.3%) and foot fracture (n=14.3%). The average (mean) team can expect eight severe injuries per season.

In this study, defenders injuries (n=125, 35.7 % of all injuries) and midfielders (n=104, 29.7 %), followed by strikers (n=88, 25.2 %), as well as goalkeepers (n=33, 9.4 %).

In our study, players were about 3 times more likely to be injured within the last half of a match compared with the primary half. The amount of the half wherever players were most in danger was throughout the last 15min of traditional time and within the 15min immediately after half-time.

In our study, traumatic injuries were additional common throughout the competitive season (Sep to May), whereas overuse injuries peaked throughout the pre-season preparation period in July. The incidence of ankle joint sprains, knee joint injuries was constant over the season. Muscle strains and ligament sprains are the most common injuries during both the pre and competitive seasons.

In our study, no clear prevention programs were denoted except general use of player equipment's as shin guard; many players use some protective braces and medical plaster for muscle cramps and tear.

Football injuries are the major factor affecting player's performance. Thus, appropriate strategies, aimed at reducing injuries, ought to be implemented.

## CONCLUSIONS

Despite the limitations, the injury rate in Egyptian male football is high, the most common injuries recorded were Hamstring strain, knee joint injuries and ankle joint injuries. Players more likely to be injured within the last 15 minute of the match compared with the rest of the match. The rates of injuries in match are higher than training. Traumatic injuries common throughout the competitive season, whereas overuse injuries peaked throughout the pre-season preparation period in July. The incidence of ankle joint sprains, knee joint injuries was constant over the season.

This study showed a high prevalence of overuse injuries among players during the preseason period. Prevention of preseason injury is important to ensure availability of players for the commencement of the season and to decrease the risk of injury later in the season, we recommend the implementation of prevention programmers and good preseason preparation for this purpose.

We denoted that there is a horrible lack in documenting the injuries duo to lack of medical personnel, medical care.

This study needs additional analysis on rates of injuries, associated risk factors and prevention programs. Strategies for prevention of and early intervention with severe injuries are needed to reduce the number and severity of the injuries. They must

increase awareness about medical care, coaching techniques, player equipment's and FIFA rules to protect players. Emergency services must be always available during training and competitions.

Finally, the medical research about football medicine in Egypt is very poor and in need to increase because it is a first public game in Egypt and all over the world.

There is lack of medical care provided to football at Dakahlya governorate that need to develop rules and procedures as well as start working for injury prevention programs.

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