An overview of injury prevention for soccer players in Pakistan: A sports rehab perspective

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Abstract

Soccer (football) is one of the most popular weight-bearing sports in the world, which involves activities such as jumping, running and turning. Soccer related injuries have the highest incidence in all sports and are more common in young amateur players. The most important modifiable risk factors include neuromuscular control, postural stability, hamstring strength and core dysfunction. The International Federation of Football Association introduced FIFA 11+; an injury prevention programme for reduction in the rate of injuries in amateur and young soccer players. It focusses on the training of dynamic, static and reactive neuromuscular control, proper posture, balance, agility and control of the body. This training protocol is not being used in Pakistan at amateur level who neither possess the resources, nor the knowledge or proper guidance in risk factor assessment, prevention, and subsequent sport injury management. In addition, the physicians and rehabilitation community are not much familiar with it except for those directly involved in sports rehabilitation. This review highlights the importance of including FIFA 11+ training programme in the curriculum and faculty training.

Keywords: Athletic injuries, physical education and training, rehabilitation, risk factors, sports, soccer.

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Introduction

Soccer (football) is one of the most popular sports in the world. The FIFA's Big Count survey reveals that approximately 270 million players are actively playing soccer around the globe, which makes up to 4% of the total population and is a continually growing sport.[1]

Injuries in Soccer players

Soccer is a weight-bearing sport and involves a lot of footwork such as running, turning and jumping. Soccer-related injuries have the highest incidence rate among all sports injuries in most parts of the world.[2] Players' bodily movements and actions during soccer (i.e., sprinting, running, decelerations, acceleration, direction change, tackling, turning, twisting, jumping and landing) along with forceful high impact body contact during matches and practice sessions predisposes the athletes to chances of injury. There is no published literature on soccer injuries and their prevention or treatment in Pakistani players. Data from the European countries suggest that even during training, 1-5 injuries per 1000 hours of practice time, and a rate of 15–20 injuries per 1,000 match hours has been documented in young soccer players.[3]

Most (60–90%) of the soccer injuries involve the lower limbs specifically the ankle, knee, and thigh. Gender differences also exist among the injury sites. The most frequent injuries in male players are of the hamstring muscles, followed by the ankle, knee, and groin. Whereas in the female players, knee and ankle injuries are most common, followed by thigh/hamstring injuries.[4,5]

Several risk factors have been identified including joint instability, muscle imbalance, lack of proper training and inadequate rehabilitation. Most of the eccentric work during play is absorbed by knee joint during cutting maneuver, sprinting, decelerations, or landing. As a result, knee is predisposed to adductions/abduction in sagittal axis, internal/external rotations in vertical axis, and hyperflexion/hyperextension and all of them are linked to noncontact knee injury mechanisms.[6] These injuries are even more common in young amateur players who neither have the resources, nor the knowledge or proper guidance in risk factor assessment, prevention, and subsequent sport injury management. For this purpose, players and coaches must be educated better, along with inclusion of injury prevention interventions as a part of regular training.[7]

Risk factors for sports injuries in soccer

The risk factors predisposing young amateur athletes to higher rates of musculoskeletal injuries are classified as non-modifiable (anatomical factors, joint laxity, growth, and maturation) and modifiable risk factors (neuromuscular control, postural stability, hamstring strength and core dysfunction). Another risk factor associated with a higher rate of lower limb injury, mainly anterior cruciate ligament injury, is poor landing

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mechanics, particularly increased dynamic knee valgus. Different types of training can lead to changes in the modifiable factors. Neuromuscular factors are involved in control of hamstrings and quadriceps imbalances, asymmetry of legs dynamic knee stability, and core dysfunction. Multiple studies have shown that comprehensive injury-prevention training consisting of plyometrics, balance, agility and core-stability exercises decrease the occurrence of sport injuries.[8,9]

FIFA 11+ Injury Prevention Programme

In order to decrease the incidence of soccer injuries in amateur and young soccer players, an injury prevention framework- FIFA 11+ was developed in 2006 after a collaboration between International Federation of Football Association (FIFA), Medical and Research Centre (F-MARC), the Santa Monica Orthopaedic and Sports Medicine Research Foundation (SMSMF)[11] and the Oslo Sports Trauma Research Centre (OSTRC). It was planned to be used as pre-training warm-up protocol which included a total of 15 different exercises to improve the physical fitness components which might be contributory to injury prevention.[10]

The principal goal of this framework is the training of static, dynamic and reactive neuromuscular control, proper posture, balance, agility and body control during the exercises. This programme consists of a combination of three key exercise components: preliminary running and stretching exercises, next component of strength, plyometric and balance exercises, and lastly high speed planting and cutting exercises.[10] The efficacy of utilizing this programme was reported in various studies. Arsenis and colleagues reported that application of FIFA 11+ injury prevention programme for eight weeks results in improvement in hamstring strength and some components of lower limb balance, both of which are essential elements of preventing muscle strains and other soccer injuries.[11]

In this programme, one of the constituents involves the training of core musculature. The core represents a functional unit, including trunk muscles (abdominals, back extensors) and those of pelvic-hip region. It is a central link in the functional kinetic chain ability. Core stability in sporting environment has been defined by Kibler et al as "the ability to regulate the motion and position of trunk over pelvis to allow optimal production, control, and transmission of force and motion to the terminal segments in coordinated athletic activities. In all sporting movements, energy is transferred from one segment to the next in the kinetic chain model. Growing scientific evidence indicates that the preservation of core strength and stability is integral for optimal lower limb functioning, particularly the knee joint. Hence it is essential for soccer players to possess adequate strength and neuromuscular control in trunk and hip musculature in order to ensure core stability.[12]

Soccer being complex contact sport, is associated with high injury rates with muscle injuries making up to 37% of all time-loss injuries in professional male soccer players. A 6-year prospective study on injury incidence of soccer players revealed that the most common injury was hamstring strain, followed by ankle sprains and adductor strain.[13] Similarly, a study by Tahir et al on athletes in Lahore, Pakistan reported that the frequency of hamstring strain injuries was highest (approximately 70%) in athletes with 35% recurrent injury rate. They concluded that age and previous injury were the primary risk factors for occurrence of injury among university athletes, and it was mainly due to absence of sports specific coaching.[14] Though there is evidence that isometric and isokinetic strength trainings are important in those athletes who are participating in sports requiring dynamic hip strength and experiencing knee pain as well.[15]

Challenges faced by soccer players in Pakistan

Pakistan is one of the largest producers of high-quality soccer balls. However, the country has not produced good soccer players at the international level. Young Soccer players in Pakistan do not have access to purpose-built grounds, proper shoes and footwear, protective gear, skilled coaches and lack of knowledge about the importance of adequate warm up and cool down. Incorporation of FIFA 11+ programme can help the players to avoid injury place and enhance their performance by improving neuromuscular control deficits. Majority of the players are unable to reach the elite level due to the recurrent injuries, which can be avoided by the introduction of rehabilitation at amateur level. Lack of awareness and limited availability of rehabilitation professionals trained in sports medicine is another challenge, which leaves the players with no choice other than self-management. Very few injured players approach rehabilitation medicine physicians, orthopaedic surgeons and physical therapists for clinical assessment and rehabilitation management. Most of the health care professionals are themselves not familiar with the utility and scope of sports rehabilitation. The concept of muscle re-education and return to functional athletic activity is known, but the component of performance enhancement and risk factor reduction is not focused upon in amateur and elite level players. This missing link must be integrated in training protocols, as well as should be made a part of formal curriculum of health care and physical education disciplines.

Conclusion

For the competitive training of sports players and athletes, functional training, strength and conditioning should be targeted to reduce the risk of injury and improve peak performance. Particularly for soccer related injuries, FIFA 11+ injury prevention programme should be implemented at all levels. Its background knowledge as well as physical application should be a part of physical education and health care disciplines in Pakistan, so that health care professionals are familiarised with this aspect of sports rehabilitation. Hence, they could effectively play a role in the avoidance of recurrent injuries and improvement of performance among amateur and elite soccer players.

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