

9. SPORTS INJURIES AND PREVENTION

O-051 Risk factors for overuse knee extensor mechanism disorders in adolescent soccer players

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OBJECTIVE Overuse disorders of the Knee Extensor Mechanism (KEM), such as Osgood-Schlatter's disease, are common in adolescent soccer players. Although those disorders are said to be related to increased tension in the KEM, which is elongated by rapid skeletal growth during the growth spurt period, a simple and quantitative measurement for the tension has to be established to prevent disorders. We hypothesized that tension in the KEM could be evaluated using a tissue hardness meter. In this prospective study, we investigated the incidence of overuse disorders of the KEM and examined whether different variables, including KEM tissue hardness, could be identified as risk factors for KEM overuse disorders in a multivariate model.

METHODS A total of 184 legs belonging to 92 adolescent male soccer players, aged 13.1 ± 2.5 (mean \pm SD) years, were examined in the study. In the initial medical check-up, physical features, including KEM tissue hardness, were examined. After the initial medical check-up, we prospectively observed the incidence of KEM overuse disorders for a period of one year.

RESULTS During the observation period, KEM overuse disorders occurred in a total of six legs from four individuals, including Osgood-Schlatter's disease and jumper's knee. In the logistic regression analysis, increases in absolute body weight over the year and KEM tissue hardness were found to be significant predictor variables for the incidence of disorders (Table 1).

Table 1. Significant Predictor Variables for Overuse Knee Extensor Mechanism Disorders in Adolescent Soccer Players from the Logistic Regression Analysis

Variable	OR	95% CI	P
Increase of body weight ^b	1.95	1.24-3.06	<0.01
Tissue hardness ^c	1.41	1.02-1.96	<0.05


^a OR : odds ratio, 95% CI : 95% confidence interval, P : P value. ^b Increase of body weight over a year.

^c Tissue hardness of knee extensor mechanism.

CONCLUSION Based on our results, it can be concluded that increases in body weight and KEM tissue hardness, which may cause knee overload, are valuable predictive indicators for the incidence of KEM overuse disorders. In a future study females can also be included and the sample size can be increased to shed further light on the relationship between risk factors and the incidence of KEM overuse disorders.

KEY WORDS overuse injury, adolescent soccer player, risk factors, knee extensor mechanism, tissue hardness.

O-052 Prevention, rehabilitation and re-injury-prophylaxis of knee and ankle injuries in young elite soccer players

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OBJECTIVE Epidemiological studies show an increased number and impact of serious knee and ankle injuries that occur not only in the field of high level senior soccer but also with dramatically rising figures in youth soccer. Therefore, the German Federal Institute of Sport Science (BISp) promotes a several years lasting interdisciplinary project in close cooperation with the German Soccer Federation (DFB). Injuries of the lower extremities or the proneness to certain knee and/or ankle injuries are thought to be caused by many factors. Therefore the aim of this study was to

optimize prevention, rehabilitation and reinjury-prophylaxis of knee and ankle injuries in soccer and get information about the coherences of physical, psychological and biomechanical data concerning injury frequency.

METHODS Diagnosis variables include the individual knee and ankle stability, coordinative and psychological abilities. Thus, a manifold of research disciplines (biomechanics, training science, psychology, medicine) worked together. Five elite male youth soccer teams (U 17, U 19) of five 1st division clubs (n=157 players) participated at eight diagnosis sessions throughout two seasons.

RESULTS Data of the coordinative abilities showed gradual increase during the observed period as well as increased values of knee stability, whereas maximum isometric strength did not improve. Psychological data suggested that the measured mood status correlated with training intensity and injury in single cases. A multivariate analysis was conducted for all variables and for all measurements is in progress.

CONCLUSION First results indicated a positive influence of the proprioceptive training concerning knee stability and coordinative ability, even though there seemed to be no structural changes. Psychological data would be very useful for coaches to modify the training process, as well as provide increased awareness of the body perceptions of the soccer players.

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KEY WORDS injury, prevention, elite youth soccer, interdisciplinary

O-053 Safety measures against tackle in rugby union

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OBJECTIVE Rugby union has a high rate of injuries, caused by tackling to head, neck and facial regions. In Japan, there was an increase in the frequency of tackle-related head injuries. The incidence of head injuries were higher in the younger generation of the under 19 players, compared to that of adults in Japanese rugby union players. This study investigated the effectiveness of the shrug motion (Shrug) tackle and the power-foot (Foot steps in the base of support powerfully) tackle in preventing tackle injuries. Furthermore, the effectiveness of the tackle skill to prevent tackle injuries were investigated

METHODS 30 Japanese university rugby union players participated. The electromyographic (EMG) activity around the neck was recorded using surface electrodes. The maximum force and impulse of Shrug and Non-Shrug (N-Shrug) with EMG were analysed with separate repeat-measures analysis of variance. The muscle tonicity of the Power-foot tackle and the Diving-tackle were analysed with EMG.

RESULTS Both of 45° and 60° mean normalized EMG of the shrug were higher for the bilateral upper trapezius than those of the non-shrug (p<0.05). There were significant differences in the angle of anterior incline between Shrug and N-shrug (p<0.05). The trapezius muscle tonicity of the power foot tackle was higher than that of the Diving tackle (p<0.05).

CONCLUSION The tackled skill based on these results was coached for head and neck injuries to U17 and U19 players at all areas in Japan. The numbers of the severe head injured players have decreased after that. These findings suggest that the tackle with Shrug and the power-foot may contribute to decreasing the severe tackle injuries of the rugby union players.

KEY WORDS Power-foot, shrug, tackle.

O-054 Watch out: Is it safe to play soccer on synthetic turf for ACL injury?

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OBJECTIVE Since the numbers of synthetic turf are getting higher as playing surfaces there has been great focus on high risk for Anterior Cruciate Ligament (ACL) injuries in soccer as it is the most favourite worldwide sport with a large number of participants played at amateur and professional levels. The objective of this study was to analyze retrospectively the injury mechanisms of ACL ruptures related to type of sport and by focusing on soccer the importance of synthetic playing surface as injury mechanism.

METHODS Examination of the records from the sports physiotherapy unit (outpatient clinic of Hacettepe University, School of Physiotherapy & Rehabilitation) showed that over the period 1991-2006, 327 cases with mean age; 27.6 ± 7.8 (range 13-62), mean weight and height; 73.79 ± 11.23 and 175.4 ± 9.2 ; either followed after a reconstruction or had conservative treatment for ACL. The cases were investigated by means of sports activity, type of sport that caused the injury, injury mechanism focusing on playing surface.

RESULTS 304 (93%) of the cases had been doing sport rather professionally (44.1%) or amateur (55.9%). 85.3% had a surgery. 62.4% of the cases had an isolated ACL rupture, 37.6% had another accompanying injury. The types of sports caused the injury were shown in Table 1. For 57% of the cases the reason was soccer. 93.6% of amateur, 82.6% of professional soccer players had injury on synthetic turf.

Table 1. The types of sports that caused the injury.

MECHANISM	Number	Percentage
Soccer	186	56.9
Westling	5	1.5
Ski	16	4.9
Basketball	31	9.5
Teakwando	7	2.1
Volleyball	11	3.4
Hentball	11	3.4
Track and field	4	1.2
Tennis	5	1.5
Nonsportive trauma	51	15.6
Total	327	100

CONCLUSION Playing fields as tough as synthetic turf that is not suitable for standard conditions may indicate a risk factor for ACL ruptures not only for amateur players but also professionals. Therefore we would like to warn especially amateur-weekend soccer players about the surface that if you play on synthetic turf you are probably at high risk of having a rupture of ACL.

KEY WORDS Soccer, ACL injury, risk factor, pitch surface

O-055 Computerization of soccer injuries: A key for supervision of injuries and elaboration of preventive guidelines

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OBJECTIVE Variations in definitions and methodologies have created differences in the results and conclusions obtained from studies of soccer injuries, making interstudy comparisons difficult. A working document on definitions, methodology, and implementation was discussed by UEFA Injury Consensus Group. To register and analyze the injury aetiology in the sport, in addition to numerous variables associated with interests like location, injured weave, injuries mechanisms, intrinsic (previous injuries, load of training, competitive load, physical training conditions, etc.) and extrinsic (thermal stress, type of pavement, etc.) risk factors.

METHODS "PryLesión: Control of sport injuries®" was presented in this study, which is a computer application that allows the supervision of injuries in soccer and associated factors (as much predisposition, as of course and resolution).

The program was designed by starting from the Multifactorial Model, following recommendations and protocols standardized at an international level (UEFA Medical Group).

RESULTS Data of the supervision of different football teams are offered like example, analyzing the effect of different associate variables (age, competitive load, etc.)

CONCLUSION Prylesion® constituted a tool of easy handling and discharge power to monitorizing sport injuries. It allowed to explore the associated aetiological factors to the injury problem. Facing an integral prevention and control of the training, the application also allowed information that should be integrated into training programs.

KEY WORDS Soccer injuries, informatizing data collection
