

Prevention of injuries among male football players – a prospective, randomized intervention study targeting players with previous injuries or reduced function  
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### **Objectives**

To examine the effect of targeted exercise programs to prevent injuries among male football players with a history of previous injury or reduced function in the ankle, knee, hamstring or groin

### **Materials and methods**

A total of n=508 players representing 31 teams in the Norwegian 1<sup>st</sup>, 2<sup>nd</sup> or 3<sup>rd</sup> division were included in the study. Based on a questionnaire with the inclusion criteria previous acute injury during the last 12 months to the ankle, knee, hamstring or groin or a reduced function with an average score less than 80% in either of the above mentioned four body parts, the players fulfilling any of the inclusion criteria for any of the four body parts, were divided into the high risk (HR) group (n=388), the rest in the low risk (LR) group. The high risk players were randomized individually, but within each team into two groups, the HR intervention group (n=193) and the HR control group (n=195), resulting in each team having players from all three group (HR intervention, HR control, and LR control). Each intervention player received training programs and equipment needed for the body part causing inclusion, and was instructed by the team physiotherapist to train three times a week for a ten weeks period in the pre-season. Training/match exposure and injuries were reported for all players in the team throughout the season 2004.

### **Results**

A total of 505 injuries were reported, sustained by 283 (55.7%) of the 508 players included in the study. The total incidence of injuries for all groups taken together was 4.7 injuries per 1000 playing hours [4.3 to 5.1], 11.9 [10.4 to 13.5] for match injuries and 2.7 [2.3 to 3.1] for training injuries. For the different groups, the total injury incidence was 3.2 [2.5 to 3.9] in the LR control group, 5.3 [4.6 to 6.0] in the HR control group ( $P=0.0001$  vs the LR control group), Z-test) and 4.9 [4.3 to 5.6] in the HR intervention group ( $P=0.50$  vs the HR control group).

For the main outcome measure, the sum of injuries to the ankle, knee, hamstrings and groin, the total incidence was 2.3 injuries per 1000 playing hours [2.1 to 2.6]. The corresponding figure was 1.3 [0.9 to 1.8] for the LR control group, 2.8 [2.3 to 3.3] in the HR control group and 2.6 [2.1 to 3.0] in the HR intervention group. There was a significantly lower injury risk in the LR control group compared to the two other groups ( $P=0.0002$  vs the HR control group,  $P=0.001$  vs the HR intervention group). However, there was no difference between the HR intervention group and the HR control group ( $P=0.57$ ).

In intention-to-treat and per-protocol analyses, we found no significant difference between the compliant HR intervention players and the HR control group in any of the four body parts.

### **Conclusions**

We were able to identify the players with a significantly increased risk of injury through a questionnaire on previous injuries and joint and muscle function only.

The introduction of specific preventive training programs did not affect the injury risk. This may be partly explained by a low compliance in the HR intervention group and the fact that 19 of the 31 teams trained preventive exercises on a team basis, resulting in HR control group players carrying out the same exercises as the HR intervention group.