

Injury prevention training in football: let's bring it to the real world

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Overall injury rates remain high in elite football despite the significant research on injury prevention.¹ One of the reasons is the players' low adherence to injury prevention programmes due to their experience of muscle soreness and 'heavy legs during the match'.² Additionally, prevention training compliance may be reduced due to the 'desire to perform as much training as possible with the team'.² This may be the reality in high-level football, but can we do better? This editorial aims to present evidence-based approaches for improving injury prevention implementation in real-world settings.

TRAINING PERIODISATION: INJURY PREVENTION STARTS IN THE OFF-SEASON

The off-season is a crucial period for physical and mental recovery. However, there are two main risks associated with prolonged absence from training: (1) a decline in physical capabilities (mainly aerobic fitness and muscle strength) associated with performance and injuries and (2) a reduction in chronic workload. With regards to the latter, it was shown that a 50% reduction in training load for 4 weeks would take an additional 2.5 weeks to restore full capacity. If players perform no training during the off-season or take a longer break, it would take even longer to build chronic loads to return to full capacity.³ To ensure adequate post-season recovery, while also alleviating the adverse effects of training breaks on aerobic fitness, we recommend maintaining training intensity while reducing training volume and frequency in the off-season.

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OFF-SEASON IS A LONG WAY FROM THE WEEKLY GRIND OF MATCHES

Given the demanding fixture schedule, injury prevention training during the competitive season is a challenge. Players' experience of soreness or heavy legs following eccentric training may be minimised by effective training planning. In a study with clubs around the world, 50% reported performing injury prevention 48 hours before the match.⁴ This may be a less than ideal practice, given that muscle soreness from eccentric hamstring exercise will peak 48–72 hours post-training. Is there a solution? It seems that performing injury prevention programmes including strength training and Nordic hamstring exercises the day after the match carry fewer adverse effects (eg, less muscle damage and soreness) than the same training performed 3 days postmatch.⁵

HOW TO SCHEDULE YOUR INJURY PREVENTION TRAINING WITHIN THE DAY

Fitting the injury prevention programme within the training day also poses a challenge. Strength training and neuromuscular and/or proprioception exercises

can be performed either before, or at the end of training depending on the focus of exercises. The 11+ which incorporates balance, proprioception and fitness drills could be part of the warm-up.⁶ In this case, team training will not be compromised. It is noteworthy that injury prevention programmes that included the Nordic hamstring exercise performed during the warm-up reduced hamstring injury risk among football players. Although equivocal, eccentric strength exercises conducted post-training may reduce the negative influence of fatigue on hamstring strength,⁷ and possibly mitigate hamstring injury risk. In fact, players who performed eccentric training in the fatigued state, compared with non-fatigued, showed better maintenance of eccentric hamstring strength during a simulated match.⁷

CAN SMALL-SIDED FOOTBALL DRILLS PROTECT AGAINST INJURIES?

Injury prevention programmes may protect from injuries but the majority of football training time is spent in small-sided games (SSG). Although SSG improve tactical aspects of the game, they may undermine some critical physical attributes (eg, maximum sprinting ability) that are protective against injuries. This may be due to limited available space preventing players from covering enough distance at high speeds. Hence, players might not get enough protection for hamstring injuries, which usually happen during high-speed



Figure 1 Efficacy of small-sided games (SSG) for developing skill and repeated-sprint ability in elite football players (reanalysed data⁸). Only 22% of players met the average frequency of match repeated-sprint bouts. This finding highlights the need to complement SSG with high-intensity interval training to simulate the match demands.

running. While acknowledging the importance of SSG on other potential injury risk factors (ie, mechanical workload), it seems that some types of SSG (4 vs 4, 5 vs 5, 6 vs 6, 8 vs 8) might not prepare players for the ‘worst-case scenarios’ expected during match-play (figure 1). What can we do? One option is to customise SSG and other training drills to simulate the high-speed running demands of competition. Complementing SSG training with high-intensity intermittent running that involves changes of direction could also be considered.

PRACTICAL TIPS

Proper workload management, along with well-developed physical qualities (aerobic fitness and muscle strength) are the priorities to mitigate non-contact injury risk. Effective periodisation of injury prevention training may also help. Here are some practical tips for sports medicine professionals:

- ▶ Postseason break is an opportunity to build fitness and correct muscle deficiencies. For fitness training, players may benefit from lower volume, high-intensity sessions.
- ▶ Injury prevention programmes should be executed all year around. Post-match day 1 may be more suitable for injury prevention programmes that

include eccentric exercises for the hamstring.

These exercises could be performed either at the start or the end of training depending on the priority.

- ▶ High-intensity interval training with changes of direction that contain accelerations and decelerations should be used to complement SSG. Customising SSG to simulate the high-speed running demands of competition may also help.

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