A congested football calendar and the well-being of players:

The correlation between exposure to match play for football players in European clubs during the months prior to the World Cup 2002 and the injuries and performance of these players during the World Cup

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A congested football calendar and the well-being of players.

The correlation between exposure to match play for football players in European clubs during the months prior to the World Cup 2002 and the injuries and performance of these players during the World Cup.

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Key words: Football, injury, epidemiology, soccer, World Cup
Abstract

Objectives: To investigate the correlation between exposure to match play for football players in European clubs during the months prior to the World Cup 2002 and the injuries and performance of these players during the World Cup.

Methods: The team doctors at eleven of the best football clubs in Europe prospectively recorded player’s exposure and injuries during the 2001-2002 season (July 2001-May 2002). Sixty-five players participated in the World Cup in Korea/Japan (June 2002). During the World Cup, the clubs reported injuries sustained by these players, and their performance was evaluated by three international experts.

Results: The number of team matches during the season varied between 40 and 76 for the different countries involved. The individual player had a mean of 36 matches during the season. Top players played more matches, especially during the final period of the season. Players that participated in the World Cup (WC players) played more matches during the season compared to players who did not participate in the World Cup (46 vs 33 matches). WC players did not show an increased risk for injury during the season.

Twenty-nine per cent of the WC players incurred injuries during the World Cup and 32% performed below their normal standard. The players who underperformed in the World Cup played more matches during the 10 weeks prior to the World Cup compared to those who performed better than expected (12.5 vs 9, p< 0.05). Twenty-three (60%) of the 38 players who had played more than 1 match/week prior to the World Cup incurred injuries or underperformed during the World Cup.
**Conclusions:** There is a considerable variation in the number of matches played per season in European professional leagues. Top-level players are obliged to play many matches especially during the final period of the season.

**Introduction**

The overall level of injury for a professional football player has been reported to be approximately 1000 times higher than that of a high-risk industrial worker. A research group at the Football Association of England evaluated the risk and pattern of injuries in professional English football. The results showed that each injury caused, on average, absence from 4 matches, and that each week approximately 10% of a squad was unable to train due to injury. The financial loss attributable to absence of injured players during the 1999/2000 season in the English football leagues (92 clubs) was calculated to be approximately 125 million euros— an average of 1.4 million euros per team.

Many football injuries can be prevented if appropriate prophylactic measures are taken. Ekstrand et al. published the first prospective randomised intervention study on amateur teams in 1982 showing that the rate of injury was 75% lower for the intervention teams compared to the control teams. Recently these findings were verified in an intervention study on amateur youth players performed by the F-Marc group, a research group within FIFA (Fédération Internationale de Football Associations).

The mechanisms behind football injuries are complex and multifactorial. The way in which the season is planned is an important factor from the point of view of injuries. Ekstrand et al., studying the relationship between training and matches at amateur levels, found that a high training/match quotient with many training sessions
in relation to the number of matches played, gave greater success and fewer injuries. However, this relationship has not been studied at professional level.

UEFA (Union des Associations Europeéennes de Football) has expressed its concern over the demands being placed on modern footballers, and the translation of these physical and mental demands into injury syndromes. UEFA therefore initiated a research project specifically aimed at evaluating the exposure to football and the risk for injury of top-level football players in Europe. Since this study provided information on exposure and injuries for many of the top European clubs during the season preceding the World Cup, players that participated in the World Cup were also followed during the World Cup period.

The aim of this study was to evaluate the correlation between exposure to match play for football players in top European clubs during the season prior to the World Cup 2002 and the injuries and performance of these players during the World Cup.

**Material and methods**

Fourteen of the top European clubs (clubs that have participated at the highest level in Europe over the last decade) were selected by UEFA and invited to take part in the study. The authors contacted the clubs and sent them information about the study. Before the study began, each team doctor was invited to a meeting for further information about study details. To avoid variation in data collection, great effort was put into standardising study details, such as the definition of injury, who determines when a player is fully rehabilitated after an injury, what should be regarded as a training session, etc18.
Each club selected a contact person who was responsible for collecting data from the club and forwarding the information to the study group.

One team declined participation and two teams were excluded from the study due to insufficient data. The following eleven teams accepted participation, delivered complete data and were thus included:

- Arsenal FC (England)
- Manchester United FC (England)
- Paris Saint-Germain FC (France)
- Stade Rennais FC (France)
- RC Lens (France)
- AC Milan (Italy)
- Juventus FC (Italy)
- Internazionale FC (Italy)
- AFC Ajax (Netherlands)
- PSV Eindhoven (Netherlands)
- Real Madrid CF (Spain)

**Inclusion / exclusion criteria**

All contracted players in the A-teams during the first month of the study (July 2001) were invited to participate in the study. Players contracted to the teams after July were not included. Players with an injury at the start of the study were included but this initial injury was not included in the injury statistics.
The players were informed about the study and accepted participation by signing an informed consent form.

**Data collection**

The clubs were provided with attendance record forms. The club contact person was responsible for completing this form with data about the players’ attendance at training sessions and matches. Exposure times were registered in minutes for each individual player in order to base the incidence of injury on real exposure time. The attendance records included all training sessions and matches for the A-team. Only coach-directed sessions that included physical activity were recorded. If selected players participated in training sessions and matches outside those for the A-team (e.g. B-team, youth matches, or training sessions or matches for different national teams), this information was also included. In order to assess the risk for injury and exposure of the individual players in each team, it was important to include exposure to national team participation and the injuries that possibly occurred as a result thereof. The contact person at each club therefore included exposure to matches and training sessions with the national team in the attendance records and, in the event of injury, filled in an injury card.

**Definition of injury**

All injuries were recorded on a special card. A recordable injury was defined as one that occurred during a scheduled match or training session and caused the player to miss the next match or training session.
Rehabilitation

A player was considered injured if he could not fully participate in all parts of a collective training session and was considered fully rehabilitated when he had full clearance from the club’s medical officer.

Study period

The study covered the period from July 2001 to July 2002 and included the normal European football season (July 2001 to May 2002) as well as the World Cup 2002 in Korea/Japan (June 2002).

Participation in the World Cup 2002

A total of 266 players were included in the study. Sixty-five of these players played matches in the World Cup in Korea/Japan. Six other players were selected for the World Cup but since they did not play in any World Cup match, evaluation of their performance was impossible and these 6 players were placed in the non-World Cup player group. Anthropometric data of the players for the two groups are presented in Table 1.

Table 1. Anthropometric data for the 65 players who participated and the 201 players who did not participate in World Cup matches in Korea & Japan 2002.

<table>
<thead>
<tr>
<th></th>
<th>World Cup players</th>
<th>Non-World Cup players</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of players</td>
<td>65</td>
<td>201</td>
</tr>
<tr>
<td>Age (years)</td>
<td>26</td>
<td>26</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>181</td>
<td>181</td>
</tr>
<tr>
<td>Weight (kg)</td>
<td>78</td>
<td>78</td>
</tr>
</tbody>
</table>
The clubs reported injuries sustained by these players during the event and during the preparation period with their national team before the World Cup (15/5-30/5). The exposure to training, however, was not recorded during this period.

The performance of the players during the World Cup was evaluated by a group of three international experts (international coaches and former coaches of national teams in Europe). These experts were given a list of the 65 players and asked to assess their performance according to one of three levels:

- **Overperformance** (the player performed above his normal standard)
- **Normal performance** (the player performed as expected)
- **Underperformance** (the player performed below his normal standard)

**Analyses**

Comparisons were made between the World Cup players and the players that did not participate in the World Cup (non-World Cup players).

The groups were compared for qualitative variables with the chi-square test, or the Fisher’s exact test for small numbers. Due to a non-normal distribution, quantitative variables were compared between groups using the Mann-Whitney U-test for unpaired comparisons and the Wilcoxon signed rank test for paired group comparisons. The significance level was set at p<0.05. Results are expressed as mean with standard deviations (SD) and 95% confidence interval (95% CI).

**Results**

**Exposure and risk for injury during the whole season**
Exposure for the teams

The overall exposure to football during the full season for the eleven teams was 70,000 hours (58,000 training hours and 12,000 match hours).

Each team had an average of 280 activities (training sessions and matches) during the season. The number of matches, however, differed between the various countries, ranging from 40 to 76 matches. The teams that played more matches obviously had less time to devote to training sessions.

Exposure for individual players

Each of the 266 players participated in a mean of 175 training sessions and 36 matches during the season. Exposures for the WC players and the non-WC players are shown in Table 2. The 65 players who later participated in the World Cup (June 2002) played significantly more matches during the ordinary season (July 2001- May 2002) compared to the 201 players who did not participate in the World Cup (46 +/- 13 vs. 33 +/- 16, p<0.001). There was no difference between the two groups regarding the number of training sessions during the season.

Risk for injury

Table 3 shows the injury incidences for the World Cup and the non-World Cup players during the season. The World Cup players had a lower risk for training injury (3.2 vs. 5.5 per 1000 hours of exposure, p<0.01) whereas during match play, there was no difference between the groups.
Table 2. The number of training sessions and matches, and exposure to football during the 2001-2002 season (July 2001 to May 2002). Mean with standard deviations (SD) and 95% confidence interval (95% CI).

<table>
<thead>
<tr>
<th></th>
<th>World Cup Players (N = 65)</th>
<th>Non-World Cup players (N= 201)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Training sessions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-No./player</td>
<td>Mean (SD) (95% CI)</td>
<td>Mean (SD) (95% CI)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>181 (35) (173, 190)</td>
<td>171 (59) (163, 179)</td>
<td>n.s</td>
</tr>
<tr>
<td>Matches</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-No./player</td>
<td>Mean (SD) (95% CI)</td>
<td>Mean (SD) (95% CI)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>46 (13) (43, 49)</td>
<td>33 (16) (30, 35)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Exposure (hours/player)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-Total</td>
<td>Mean (SD) (95% CI)</td>
<td>Mean (SD) (95% CI)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>293 (50) (281, 305)</td>
<td>252 (86) (240, 264)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>-Training</td>
<td>Mean (SD) (95% CI)</td>
<td>Mean (SD) (95% CI)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>234 (42) (224, 245)</td>
<td>214 (72) (204, 224)</td>
<td>n.s</td>
</tr>
<tr>
<td>-Matches</td>
<td>Mean (SD) (95% CI)</td>
<td>Mean (SD) (95% CI)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>59 (20) (54, 64)</td>
<td>38 (21) (36, 41)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

Table 3. Injury incidences during the 2001-2002 season (July 2001 to May 2002). Mean with standard deviations (SD) and 95% confidence interval (95% CI).

<table>
<thead>
<tr>
<th></th>
<th>World Cup Players (N = 65)</th>
<th>Non-World Cup players (N= 201)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injuries/1000 hours of football</td>
<td>Mean (SD) (95% CI)</td>
<td>Mean (SD) (95% CI)</td>
<td></td>
</tr>
<tr>
<td>-Total</td>
<td>7.9 (4.1) (7.7, 11.6)</td>
<td>9.5 (3.7) (9.5, 12.8)</td>
<td>n.s</td>
</tr>
<tr>
<td>-Training</td>
<td>3.2 (2.2) (2.3, 4.5)</td>
<td>5.5 (2.1) (5.6, 8.5)</td>
<td>&lt; 0.01</td>
</tr>
<tr>
<td>-Matches</td>
<td>26.7 (15) (26.7, 46.8)</td>
<td>30.3 (13.9) (26.5, 38.2)</td>
<td>n.s</td>
</tr>
</tbody>
</table>

Exposure and risk for injury during the final period of the season compared to the rest of the season
The 266 players played a mean of 0.8 matches per week during the season (July 2001-May 2002). There was no difference in the number of matches played per week during the last 3 months of the season compared to the first eight months.

Table 4 presents the exposure to football per week during the last 10 weeks of the 2001-2002 season (March 2002 to 15th of May 2002) and the first 36 weeks of the season (July 2001 to 28th of February 2002). The 65 WC players played significantly more matches per week during the last 10 weeks of the season compared to the first 36 weeks (1.12 vs. 0.97, p< 0.01). The 201 non-WC players on the other hand, played significantly less matches per week during the last 10 weeks compared to the rest of the season (0.66 vs. 0.72, p< 0.05).

The WC players participated in 4 training sessions per week throughout the season, no difference was found between the first and last period.

The non-WC players participated in more training sessions during the first 36 weeks compared to the last 10 weeks of the season (3.8 vs. 3.3, p<0.01).

The WC players had an even distribution of total exposure (matches + training sessions) throughout the season while the non-WC players had a greater total exposure during the first 36 weeks compared to the last 10 weeks (5.6 vs. 4.9 hours per week, p< 0.001).

Table 5 shows the injury incidences during the last 10 weeks of the season compared to the first 36 weeks of the season. The injury risk at the end of the season was equal to the injury risk for the rest of the season for the WC players as well as the non-WC players.
Table 4. The number of training sessions and matches per week, and exposure to football per week during the last 10 weeks of the 2001-2002 season (March 2002 to 15th of May 2002) compared to the first 36 weeks of the season (July 2001 to 28th of February 2002). Means with standard deviations (SD) and 95% confidence interval (95% CI).

<table>
<thead>
<tr>
<th>Training sessions / week (No./player)</th>
<th>Last 10 weeks of the 2001-2002 season (March to 15th of May)</th>
<th>First 36 weeks of the 2001-2002 season (July to 28th of February)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Cup players</td>
<td>Mean (SD) (95% CI)</td>
<td>Mean (SD) (95% CI)</td>
<td>n.s</td>
</tr>
<tr>
<td>Non-World Cup players</td>
<td>4.0 (0.8) (3.8, 4.2)</td>
<td>3.9 (0.8) (3.7, 4.1)</td>
<td>n.s</td>
</tr>
<tr>
<td></td>
<td>3.3 (1.8) (3.1, 3.6)</td>
<td>3.8 (1.3) (3.7, 4.0)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Matches/ week (No./player)</th>
<th>Last 10 weeks of the 2001-2002 season (March to 15th of May)</th>
<th>First 36 weeks of the 2001-2002 season (July to 28th of February)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Cup players</td>
<td>1.12 (0.41) (1.01, 1.22)</td>
<td>0.97 (0.28) (0.90, 1.04)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Non-World Cup players</td>
<td>0.66 (0.50) (0.59, 0.73)</td>
<td>0.72 (0.34) (0.67, 0.77)</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exposure for training/ week (hours/player)</th>
<th>Last 10 weeks of the 2001-2002 season (March to 15th of May)</th>
<th>First 36 weeks of the 2001-2002 season (July to 28th of February)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Cup players</td>
<td>5.1 (1.2) (4.8, 5.4)</td>
<td>5.1 (1.0) (4.8, 5.3)</td>
<td>n.s</td>
</tr>
<tr>
<td>Non-World Cup players</td>
<td>4.1 (2.3) (3.8, 4.4)</td>
<td>4.8 (1.5) (4.6, 5.0)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exposure for matches/ week (hours/player)</th>
<th>Last 10 weeks of the 2001-2002 season (March to 15th of May)</th>
<th>First 36 weeks of the 2001-2002 season (July to 28th of February)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Cup players</td>
<td>1.43 (0.65) (1.27, 1.60)</td>
<td>1.24 (0.42) (1.14, 1.34)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Non-World Cup players</td>
<td>0.79 (0.64) (0.70, 0.87)</td>
<td>0.85 (0.45) (0.79, 0.91)</td>
<td>&lt;0.05</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total exposure/ week (hours/player)</th>
<th>Last 10 weeks of the 2001-2002 season (March to 15th of May)</th>
<th>First 36 weeks of the 2001-2002 season (July to 28th of February)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Cup players</td>
<td>6.5 (1.4) (6.2, 6.9)</td>
<td>6.3 (1.2) (6.0, 6.6)</td>
<td>n.s</td>
</tr>
<tr>
<td>Non-World Cup players</td>
<td>4.9 (2.8) (4.5, 5.3)</td>
<td>5.6 (1.8) (5.4, 5.9)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
Table 5  Injury incidences (number of injuries/1000 Hours of exposure) during the last 10 weeks of the 2001-2002 season (March 2002 to 15th of May 2002) compared to the first 36 weeks of the season (July 2001 to 28th of February 2002). Mean with standard deviations (SD).

<table>
<thead>
<tr>
<th>Injuries/1000 Hours of Exposure</th>
<th>Last 10 weeks of the 2001-2002 season (March to 15th of May)</th>
<th>First 36 weeks of the 2001-2002 season (July to 28th of February)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Injuries/1000 Hours of Exposure</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- All players</td>
<td>10.0 (5.7)</td>
<td>9.2 (2.9)</td>
<td>n.s</td>
</tr>
<tr>
<td>- World Cup players</td>
<td>10.0 (7.8)</td>
<td>7.4 (3.8)</td>
<td>n.s</td>
</tr>
<tr>
<td>- Non-World Cup players</td>
<td>9.7 (5.8)</td>
<td>9.5 (3.5)</td>
<td>n.s</td>
</tr>
<tr>
<td>Injuries/1000 traininghours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- All players</td>
<td>4.6 (3.3)</td>
<td>5.2 (2.0)</td>
<td>n.s</td>
</tr>
<tr>
<td>- World Cup players</td>
<td>4.1 (4.2)</td>
<td>2.9 (2.1)</td>
<td>n.s</td>
</tr>
<tr>
<td>- Non-World Cup players</td>
<td>4.9 (3.2)</td>
<td>5.7 (2.2)</td>
<td>n.s</td>
</tr>
<tr>
<td>Injuries/1000 matchhours</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- All players</td>
<td>34.5 (17.9)</td>
<td>28.9 (11.7)</td>
<td>n.s</td>
</tr>
<tr>
<td>- World Cup players</td>
<td>31.1 (21.0)</td>
<td>25.8 (15.9)</td>
<td>n.s</td>
</tr>
<tr>
<td>- Non-World Cup players</td>
<td>34.8 (24.7)</td>
<td>29.3 (14.6)</td>
<td>n.s</td>
</tr>
</tbody>
</table>

Analysis of the 65 WC players

During the last ten weeks of the season (1 March to 15 May) the 65 players who later participated in the World Cup played a mean of 11+/− 4 matches (range 1-19). Twenty-nine per cent (19/65) of the players incurred injuries during the World Cup, and 32% (21/65) of the players underperformed.
The players who underperformed at the World Cup had played a mean of 12.5 matches during the 10 weeks prior to the event, while those who overperformed had only played 9 matches (p< 0.05), see Figure 1.

**Figure 1.** The number of matches played during the last 10 weeks of the ordinary season (1/3-15/5 2002) for the 65 players who participated in the World Cup in Korea/Japan (31/5 – 30/6 2002). The 65 world Cup players are divided into 3 groups according to their performance during the World Cup: those who performed over or under their normal standard and those who performed as expected (normal).

Thirty-eight of the 65 players (61%) had played more than one match per week during the last 10 weeks of the season and 61% (23/38) of these players either incurred an injury or underperformed during the World Cup (8 players from the Italian World Cup team, 7 from France, 4 from Spain and 4 from England).

**Discussion**

This study shows that there are considerable differences in the number of matches played per season in the various leagues throughout Europe. Spanish and English teams play more league matches than Italian and French teams. The Spanish and the
English teams had between 65-76 matches during the season, compared to less than 50 matches for the French teams.

Given the numerous matches played by top European teams, there is a real risk for playing too many matches. In addition to the normal league matches, successful teams often take part in national and international cups, and the players also play for their country.

There is reason to believe that too many matches can lead to lack of motivation and mental burnout i.e. players are no longer able to gear themselves up for matches and training sessions\textsuperscript{19}. Their power of concentration deteriorates which can affect their co-ordination, which in turn means that the player underperforms and is more prone to injury\textsuperscript{20}. It could be that the major stress factor is not the 90 minutes of the match itself, but rather the mental preparation for matches, travel and possible adaptation to changes in time and climate\textsuperscript{13}.

Even if some clubs had between 60 and 76 A-team matches during a season, the number of matches played by individual players was much lower, a mean of 36 matches per player per season. So even if there are large differences in the number of matches played each season by clubs in different countries, there was very little difference between the countries concerning the number of matches played by individual players.

Many big clubs have large squads of skilful players, allowing them to rotate players and avoid overplay. In some cases rotation was unintentional, caused by injury or underperformance. Such clubs are not necessarily affected performance wise if a large number of players are injured because they have many players to choose from.
However, during the final period of the season, the situation may be different. At the end of the league season and in the final matches of the Champions League and UEFA Cup, teams, naturally, want to perform their best. They may therefore play all their star players even if there is a risk for mental exhaustion and injury.

The 65 players in our study group that participated in the World Cup played significantly more matches during the season than those players in our study who did not participate in the World Cup. The WC players also played significantly more matches per week during the last 10 weeks of the season as compared to the first 36 weeks of the season. The injury risk, however, was not higher for these WC players compared to the non-WC players. In fact, the WC players had a lower injury risk at training compared to the non-WC players. Even if the WC players played more matches during the last 10 weeks compared to the rest of the season, the risk for injury did not increase during this period of intense match play.

This suggests that under normal circumstances, players may be able to cope with such an intensive programme because they know that a period of rest follows. But, every four years this rest period is replaced by another intense match series due to the World Cup. In 2002, the first World Cup matches were played only two weeks after the Champions League final which could explain why a number of European players underperformed in Korea/Japan. We found that 29% of the players from our study incurred injuries during the World Cup and that 32% performed below their normal standard.

The players that underperformed in the World Cup had played an average of 12 matches during the last 10 weeks of the season compared to 9 matches for the players that performed better than expected. Furthermore, we found that almost 2 out of 3
players who had played more than 1 match per week during the last 10 weeks of the season either incurred injuries or underperformed in the World Cup.

Our finding that the risk for injury was not increased during the last ten weeks of the season despite the increase in the number of matches played, indicates that a top player can cope with a congested match calendar for a short period. The finding that many of the players either underperformed or incurred injury during the World Cup 2-6 weeks after the end of the league season indicating that the congested match calendar at the end of the season may leave the players fatigued, thus increasing the risk for injury and underperformance during the following period. As a result of the 2002 World Cup experience, UEFA decided to reduce the format of the Champions League from the 2003/04 seasons onwards.

Limitations of the study

One weakness of the study is the limited number of teams and players included. The study involved a total of eleven teams from five nations, and 65 players who participated in the World Cup 2002. In order to obtain a clearer picture of the overall situation in Europe, an expanded study including more countries and teams is suggested.

Another potential weakness was the subjective evaluation of player performance during the WC. The three international experts were all former coaches for European national teams with great experience in evaluating the performance of players. The independent evaluations were subjective but the assessments turned out to be almost identical for the majority of players. However, a few players had limited match exposures during the WC making performance classification difficult in some cases.
Finally, the lack of exposure data for training sessions during the WC preparation and tournament means that no conclusions can be drawn concerning the risk for injury for the involved players during the WC.

**Conclusions**

There is a considerable variation in the number of matches played per season in European professional leagues. Top-level players are obliged to play many matches especially during the final period of the season. This study indicates that a period with a congested match calendar can lead to football players being tired, thereby increasing the risk for injury and poor performance during the period following.

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References


**Information box**

There is a considerable variation in the number of matches played per season in European professional leagues. Top-level players are obliged to play many matches especially during the final period of the season.

A period with a congested match calendar can lead to football players being tired, which may result in injury and/or underperformance during the following period.