

Concussion in European professional football: a view of team physicians

Vincent Gouttebarga ^{1,2,3,4}, Imtiaz Ahmad,⁵ Zafar Iqbal,⁶ Emmanuel Orhant,⁷ Craig Rosenbloom,^{8,9} Kristof Sas,¹⁰ Gino M M J Kerkhoffs^{1,4,11}

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ABSTRACT

Objectives The objective was to explore the view and thoughts of physicians working in professional football about several aspects (eg, education and use of video footages) likely to enhance concussions' recognition and on-field management.

Methods An observational study based on a cross-sectional design by means of an electronic survey was conducted among physicians working for a professional football club in Belgium, England or France.

Results A total of 96 physicians (95% male; mean age: 44 years) completed the survey. Nearly all participants (95%) were in favour of informational sessions about concussion for players or technical staff. Only 5%–10% of the participants mentioned that they had felt pressured by the technical staff or players not to substitute a player with a (potential) concussion. Most participants were in favour of an additional permanent concussion substitution and a temporary concussion substitution. Four out of five participants reported that the availability of instant video footages (side-line) would ease the recognition of concussion.

Conclusion A better recognition and on-field management of concussions in professional football can only be achieved with a holistic approach, including adequate laws of the football game and protocols. Especially, regular education of players and technical staff should be made mandatory while the medical teams should be provided side-line with instant video footages.

INTRODUCTION

Concussion is induced by biomechanical forces after a direct or indirect (transmitted) blow to the head resulting in temporary neurological impairment.¹ Concussions are not very common in professional football: incidence ranges between 0.03 and 0.07 concussions per 1000 player hours in men's European professional football, and reaches up to 2.6 concussions per 1000 player hours in women professional football.^{2,3} Because of the debatable on-field management of recent concussions during high-profile matches and the growing worry for their potential long-term health consequences, concussion management in professional football has received much scrutiny.^{4–6} While the prevention of concussions in professional football

What are the new findings?

- ▶ A better recognition and on-field management of concussions in professional football can only be achieved with a holistic approach including adequate laws of the football game and protocols.
- ▶ Nearly all enrolled physicians working in professional football are in favour of regular informational sessions about concussion for players or technical staff.
- ▶ There is a strong call from physicians working in professional football for the use of instant video footages in order to ease the identification of potential concussive injuries from the sidelines of the field.
- ▶ According to physicians working in professional football, the added value of temporary concussion substitutions should be explored as soon as possible.

has always been a priority for its stakeholders, the team physician's ability to recognise and handle a concussion appropriately is central to its successful management in professional football. Following recommendations from its Concussion Expert Group, the International Football Association Board (The IFAB) has recently approved extensive trials with additional permanent substitutions for actual or suspected concussions. This was well received in professional football in the UK as medical staff showed strong support for concussion substitution.⁷ However, the view of football physicians from the UK and other countries about other measures related to concussion recognition and management should be gathered as well. The objective was to explore the view and thoughts of physicians working in professional football about several aspects (eg, education, change in the laws of the football game and use of video footages) likely to enhance concussions' recognition and on-field management.

METHODS

Design

An observational study based on a cross-sectional design by means of an electronic survey was conducted.⁸ This study was



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For numbered affiliations see end of article.

Correspondence to

Dr Vincent Gouttebarga;
v.gouttebarga@amsterdamumc.nl

conducted in accordance with the Declaration of Helsinki and the Dutch Personal Data Protection Act.⁹

Participants

The inclusion criteria for the participants of the study were as follow: (1) being a physician working for a professional football club (eg, first team, academy) in Belgium, England or France; (2) being ≥ 18 years and (3) able to read and comprehend text in Dutch, English or French.

Survey

The authors developed a total of 26 questions or statements divided in four distinct sections, namely: (1) 5 questions related to participants' characteristics (eg, 'For how many years are you working in professional football?'); (2) 5 questions and 2 statements related to concussion's education (eg, 'Does your club hold at least once every season an informational session about concussion for the technical staff?', 'An informational session about concussion should be held at least once every season for players'); (3) 8 questions related to concussion's experiences (eg, 'Before/at the start of a season, do you conduct a baseline neurological/neuropsychological assessment with your players?') and (4) 6 questions related to potential changes in concussion's approach (eg, 'Do you think that an additional permanent concussion substitution (in addition to the current 3 or 5 substitutions) would ease to assess and protect a player potentially concussed?'). Questions were answered on different response scales (eg, 'yes, no, I do not know', 5-point Likert scale from 'never' to 'always') while statements were scored on a 4-point Likert scale from 'totally agree' to 'totally disagree'.

Procedures

Based on all questions, an electronic anonymous survey (available in Dutch, English and French) was compiled (Typeform Professional). Information about the study was sent by email to potential participants by their respective national medical network within professional football in Belgium, England and France. If interested in the study, all participants gave their electronic informed consent and completed anonymously the survey. Data were collected in January 2021.

Statistical analyses

The statistical software IBM SPSS V.26.0 for Apple Mac was used for data analysis. Descriptive analyses (mean, SD, frequency and/or range) were performed for all survey's questions.

RESULTS

Participants' characteristics

A total of 96 physicians gave their electronic informed consent (response rate of 61%) and completed the survey. On average, participants (95% male) were 44 years of age and were working in professional football for 10 years (majority in highest national league).

Participants reported that they saw on average two concussions per season in matches in the team they principally worked with. All participants' characteristics are presented in table 1.

Concussion's education

While nearly all participants (93%–95%) were in favour of informational sessions about concussion for players or technical staff, a minority (34%–39%) reported that such sessions occurred at their club. Participants mentioned that especially their respective Football Association and their club was responsible for informational sessions about concussion (table 1).

Table 1 Participant characteristics (N=96) and their view on concussion education

Participant characteristics	
Age (in years; mean \pm SD)	43.7 \pm 11.7
Gender (male; %)	95
Experience in professional football (in years; mean \pm SD)	10.2 \pm 8.5
Country (N)	
Belgium	13
England	24
France	59
Team level of play (top league; %)	
Highest national league*	56
Second highest national league†	22
Youth academy	14
National team	8
Number of concussions per season (mean \pm SD)	2.0 \pm 1.1
Concussion education	
Educational session for players (%)	
Yes yearly	34
In favour to it at least once every season	95
Responsibility by the national football association	46
Responsibility by the club	39
Educational session for technical staff (%)	
Yes yearly	39
In favour to it at least once every season	93
Responsibility by the national football association	45
Responsibility by the club	46
Educational session for medical staff (%)	
Responsibility by the national football association	70

*Eerste klasse A, Premier League, Ligue 1, Super League voor Vrouwen, Women's Super League, Division 1 Féminine.

†Eerste klasse B, Championship, Ligue 2.

N, number of participants.;

Table 2 Concussion's experiences and potential changes in concussion's approach

Concussion experiences	
Baseline neurological/neuropsychological assessment (%)	
No	63
Yes with SCAT5	33
Yes with ImPACT	4
Club doctor in charge for substitution or not (%)	
Under pressure to not substitute a player (%)	97
Always/often by technical staff	10
Always/often by players	5
Potential changes	
Not enough time for player's assessment (%)	33
In favour of additional permanent concussion substitution (%)	78
In favour of temporary concussion substitution (%)	83
In favour of permanent substitution in case of bleeding head injury (%)	54
Added value of the availability of instant video footages (%)	79
Added value of the assistance of an independent physician (%)	37

ImPACT, Immediate Post-Concussion Assessment and Cognitive Test; SCAT5, Sport Concussion Assessment Tool 5.

Concussion's experiences

During their recent seasons in professional football, 97% of the participants took ultimately the decision to substitute or not a player with a (suspected) concussion, while 5%–10% mentioned that they had felt pressured by the technical staff or players not to substitute a player with a (potential) concussion. All participants' experiences are presented in [table 2](#).

Potential changes in concussion's approach

Most participants were in favour of an additional permanent concussion substitution (in addition to the regular substitutions; 78%) and a temporary concussion substitution (83%). Four out of five participants reported that the availability of instant video footages (side-line) would ease the recognition of concussion ([table 2](#)).

DISCUSSION

This study explored the view of physicians working in professional football about how to enhance concussions' recognition and on-field management. The main findings are that regular education of players and technical staff should be made mandatory while the medical teams should be provided side-line with instant video footages.

Needs to educate players and staff

The on-field management of recent concussions during high-profile football matches have emphasised how important it is to thoroughly educate players as well as

members of the technical and medical teams. With that regard, nearly all physicians enrolled in our study were in favour to an informational session about concussion at least once every season for players and the members of the technical team. As this does not occur systematically across leagues and clubs, the authors strongly recommend the alliance of national football stakeholders (football association, league, club and players' union) in order to facilitate concussion education. This has been shown to lead to better attitude towards concussion, such concussion education should even be made mandatory in professional football.¹⁰ This would follow other sports such as in English rugby union in which the yearly completion of an educational concussion module has been made compulsory for many years.

Current experience of medical teams

Physicians enrolled in our study estimated that they were seeing two concussions per season in matches (equivalent of 2.4/1000 hours of match play; consistent across countries), which is higher than recently reported elsewhere (eg, 1.2/1000 hours of match play).^{11 12} It is worth mentioning that concussion remains underreported in professional football by comparison to other contact sports, with rates up to 20 concussions per 1000 hours of match play.¹³ A positive finding was that the decision to substitute or not a player with a (suspected) concussion was taken nearly all the time (97%) by the medical team. Such an autonomy and/or leadership is important for any clinical decision but even more in the context of concussion: it is important that players and/or technical staff do not interfere in the medical team's decision. Another positive finding was that only few physicians (<10%) reported having been pressured by either players or technical staff to not to substitute a player with a (potential) concussion. Such a positive finding eliminates the main argument put forward recently to change the laws of the football game and introduce an additional permanent concussion substitution.¹⁴

Change in the laws of the football game

In December 2020, The IFAB approved to trial the use of one or two additional permanent concussion substitutions (in addition to the current three or five substitutions). Such a change in the laws of the football game is believed to put less pressure on the medical team to not to substitute a player with a (potential) concussion but as previously mentioned, nearly all physicians (>90%) working in Belgium, English and French professional football did not feel pressured by either players or technical staff. Nonetheless, and despite that this change does not provide physicians with more time for their assessment, almost four out of five physicians were in favour of additional permanent concussion substitution. More than 80% of the physicians reported that temporary concussion substitution would ease to assess and protect a player potentially concussed. Such temporary concussion substitution has been used in many high-speed collision



sports with high rates of concussions (eg, rugby union) but trialling such a change in the laws of the football game has been withheld by The IFAB.

Changes in concussion's protocols

Next to the laws of the football game set by The IFAB, concussion's protocols set by competition organisers (eg, FIFA and national leagues) are essential to recognise and manage concussions optimally. With that regard, there is a strong call from physicians for the use of instant video footages as the identification of potential concussive injuries is often impaired from the sidelines of the field. International consensus definitions of video signs of concussion have been recently established by major international sporting codes but surprisingly football did not participate.¹⁵ To protect players optimally, the authors would also like to acknowledge that the return to play protocols in professional football should prevent any player concussed over a weekend to return to play at the subsequent mid-week match.

CONCLUSION

A better recognition and on-field management of concussions in professional football can only be achieved with a holistic approach, including adequate laws of the football game and protocols. Especially, regular education of players and technical staff should be made mandatory while the medical teams should be provided side-line with instant video footages. The added value of temporary concussion substitutions should be explored as soon as possible.

Author affiliations

¹Amsterdam UMC, University of Amsterdam, Department of Orthopaedic Surgery, Amsterdam Movement Sciences, Meibergdreef 9, Amsterdam, Netherlands

²Section Sports Medicine, University of Pretoria, Pretoria, South Africa

³FIFPRO (Football Players Worldwide), Hoofddorp, Netherlands

⁴Amsterdam Collaboration on Health & Safety in Sports (ACHSS), Amsterdam UMC IOC Research Center of Excellence, Amsterdam, Netherlands

⁵Medical Department, Queens Park Rangers Football and Athletic Club, London, UK

⁶Medical Department, Crystal Palace Football Club, London, UK

⁷French Football Federation (FFF), Clairefontaine Medical Centre, FIFA Medical Center of Excellence, Clairefontaine, France

⁸The Football Association, Technical Directorate, Burton-upon-Trent, UK

⁹Queen Mary University of London, London, UK

¹⁰Medical Department, Royal Sporting Club Anderlecht, Brussels, Belgium

¹¹Academic Center for Evidence based Sports medicine (ACES), Amsterdam Movement Sciences, Amsterdam, Netherlands

Twitter Vincent Gouttebargue @VGouttebargue

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ORCID iD

Vincent Gouttebargue <http://orcid.org/0000-0002-0126-4177>

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