Medical examinations undertaken by Dutch professional football clubs

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Background
During their career, professional football players undergo periodic medical examinations intended to screen and monitor their fitness and health. In the Netherlands, information about the content of these examinations is lacking and it is not known whether they comply with current Dutch occupational medicine guidelines.

Aims
To explore the content of medical examinations undertaken in Dutch professional football clubs, and assess whether they comply with current Dutch occupational medicine guidelines.

Methods
An observational study conducted among physicians working for all clubs in the Dutch first- and second-tier professional football leagues, using an electronic questionnaire.

Results
Cardiovascular assessment based on different instruments was used in all clubs and respiratory assessment based on different instruments was used in most (87%). Other assessments such as mental health (7%), neurological (27%) or urinary (22%) assessments were only undertaken in some clubs. Seven out of the 26 clubs met some of the relevant aspects of current Dutch occupational medicine guidelines.

Conclusions
The medical examinations currently undertaken in Dutch professional football clubs are diverse in nature and not consistent from one club to another. Only a limited number of clubs meet Dutch guidelines for periodic medical examinations of workers.

Key words
Elite athletes; football; medical examination.

Introduction
According to the International Labour Office, periodic medical examinations of workers serve several purposes, including detection of clinical abnormalities, ill-health prevention and assessment of fitness for work [1]. In order to identify and monitor functioning or health abnormality and consequently reduce ill-health, various periodic medical assessments have been developed and implemented, especially in jobs with high physical demands [2–4]. Professional sport is known for its high physical demands, resulting in a high risk of injuries and also of mental ill-health and long-term health consequences [5–7].

Dutch professional football is regulated through a collective labour agreement, focussing on contractual arrangements involving finances, work conditions and medical guidance [8]. However, consensus about the content of medical examinations conducted among football players, either before or during employment, seems to be lacking. Such medical examinations should comply with professional occupational medicine guidelines applicable to all employees in Holland [9]. Furthermore, the medical examination of professional football players from the same league should be consistent from one club to another when the aim is to protect all players from the same occupational risks.

This study aimed to explore (i) the content of medical examinations undertaken in Dutch professional football players and (ii) whether these examinations comply with current occupational medicine guidelines applicable to all employees in Holland.

Methods
An observational study using an anonymous electronic questionnaire was conducted among physicians working for clubs in the highest \(N = 18\) or second highest
(N = 18) division of Dutch professional football. Ethical approval from the medical ethical committee of the Academic Medical Centre was not needed because the study was a questionnaire research study involving healthy participants. The study was carried out in accordance with the Declaration of Helsinki (2000).

Physicians were first asked to list the physical and psychological elements assessed during medical examinations of professional football players. For each element listed, four questions were asked: (i) Which form of assessment is used? (ii) What is the frequency of the medical examination? (iii) Is the medical examination

<table>
<thead>
<tr>
<th>Health-related category</th>
<th>N</th>
<th>Instruments</th>
<th>Frequency</th>
<th>Mandatory to players</th>
<th>Pre-employment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Biometrics</td>
<td>7</td>
<td>Height (n = 4); weight (n = 3); fat percentage (n = 4); BMI (n = 1)</td>
<td>1–10 times per year</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>15</td>
<td>ECG (n = 12); echography (n = 10); medical examination (n = 10); medical history (n = 1); cardiologist (n = 1)</td>
<td>1–2 times per year</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Dental health</td>
<td>5</td>
<td>Medical examination (n = 2); medical history (n = 1); dentist (n = 4)</td>
<td>1–2 times per year</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Haematological Infectious diseases</td>
<td>9</td>
<td>Laboratory analysis (n = 9)</td>
<td>1–6 times per year</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Life style</td>
<td>2</td>
<td>Medical history (n = 1); dietary specialist (n = 1)</td>
<td>1 time per year</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Medication</td>
<td>1</td>
<td>Medical history (n = 1)</td>
<td>u/nr</td>
<td>u/nr</td>
<td>u/nr</td>
</tr>
<tr>
<td>Musculoskeletal</td>
<td>8</td>
<td>Joints: ROM (n = 1); mobility test (n = 2); medical examination (n = 3); functional examination (n = 2); stability test (n = 2); clinical test</td>
<td>1 time per year</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Muscles: strength and length (n = 3); medical examination (n = 3); functional examination (n = 1)</td>
<td>Minimal 1 time per year</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Neurological</td>
<td>4</td>
<td>Medical examination (n = 1); screening test (n = 2); sensibility/locomotive test (n = 2)</td>
<td>Minimal 1 time per year</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Physical fitness</td>
<td>8</td>
<td>Shuttle-run test (n = 3); VO₂ max (n = 2); sprint test (n = 1); jump test (n = 1); strength test (n = 1)</td>
<td>1–4 times per year</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Psychological</td>
<td>1</td>
<td>Neuropsychological test (n = 1); questionnaire (n = 1)</td>
<td>Minimal 1 time per year</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Respiratory</td>
<td>13</td>
<td>Spirometry (n = 4); Lung function (n = 2); Medical examination (n = 8); medical history (n = 1)</td>
<td>1–2 times per year</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Urinary Vision</td>
<td>2</td>
<td>Laboratory analysis (n = 2)</td>
<td>1 time per year</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>Vision test (n = 7); medical examination (n = 1); ophthalmologist (n = 1)</td>
<td>1 time per year</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Pre-employment: medical examination also performed before any employment agreement. BMI, body mass index; ECG, electrocardiogram; N, number; n, number of answers within category; u/nr, unknown/not reported; ROM, range of motion; VO₂ max, maximal oxygen consumption.
Although playing Dutch professional football is a full-time occupation, footballers’ medical examinations only meet current Dutch occupational medicine guidelines in a limited number of clubs. A combined sport and occupational medicine approach would accord with the ideas of both the World Health Organization and the International Labour Organization, stating that ‘protection, promotion, surveillance and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations long after they enter their retirement years’ is a labour right and a fundamental human right that should be facilitated by social partners and stakeholders [1]. A first step in this direction could be the dissemination of relevant information about medical examinations and about both short- and long-term (post-career) adverse health effects among professional footballers in Holland.

This study has a number of limitations. Despite the fact that all professional football clubs in Holland were invited to participate in the study, only a limited number of questionnaires (15 out of 36) were finally fully usable for analysis. This might have been a source of bias. Another limitation is that the data collected was self-reported by the physicians working for the clubs and this could have introduced bias.

As far as we know, this study is the first to explore the elements involved in medical examinations undertaken in Dutch professional football players and the first to explore whether these are consistent from one professional club to another. In addition, it has the innovative feature of acknowledging professional football as akin to any other occupational category in exploring whether an occupational medicine approach is applied in professional football in Holland.

Results

Physicians from 26 out of 36 clubs (72%) answered the questionnaire, but only 15 responses were usable for analysis because of incomplete data. The elements assessed through medical examinations in Dutch professional football clubs covered 14 health-related categories (Table 1). Almost all elements of the health assessments were mandatory for players and almost all were also performed before employment. Only 7 out of the 15 clubs appeared to give thorough information to professional players on the reason, purpose, content of the medical examination and the consequences of fit or unfit for work judgements.

Discussion

Our study showed large differences in the elements of medical examinations undertaken in Dutch professional football clubs. While cardiovascular and respiratory tests were performed in the majority of the clubs, other relevant elements, such as psychological assessments, vaccinations or medication enquiries, were rarely included. It is difficult to explain why employees from the same occupational category with the same job demands are assessed differently from one club to another.

It seems that most of the medical assessments applied to professional players do not comply with the current Dutch professional occupational medicine guidelines applicable to employees from any occupational category [9]. Our study showed that only a limited number of Dutch clubs (<50%) provide information to their employees (i.e. players) about the reason, purpose and content of the medical examination and the consequence of potential fit or unfit judgements. Possible explanations for this could lie in ignorance of the guidelines among employers (i.e. club managers) and/or responsible sport physicians. The conventional culture currently prevailing in professional football may also offer a possible explanation. The medical care and support of professional football players relies mostly on a sports medicine approach, exclusively directed towards short-term health complaints (e.g. injuries of the musculoskeletal system). Adding an occupational medicine approach should be considered in order to focus on all occupational risks, including long-term (i.e. post-career) health.

Key points

- Cardiovascular and respiratory examinations of players take place in most Dutch professional football clubs, while other types of examinations, such as mental, neurological and urinary, occur less frequently.
- Although playing Dutch professional football is a full-time occupation, footballers’ medical examinations only meet current Dutch occupational medicine guidelines in a limited number of clubs.
- National minimum standards should be developed and implemented for medical examinations in Dutch professional football to achieve consistency between clubs and should also involve the dissemination of relevant information to players.

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Conflicts of interest
None declared.

References

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