

Sports medicine in The Netherlands: consultation with a sports physician without referral by a general practitioner

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Background: In The Netherlands, sports medicine physicians are involved in the care of about 8% of all sports injuries that occur each year. Some patients consult a sports physician directly, without being referred by a general practitioner. This study aims to determine how many patients consult a sports physician directly, and to explore differences in the profiles of these patients compared with those who are referred.

Methods: This was an exploratory cross-sectional study in which all new patients presenting with an injury to a regional sports medical center during September 2010 were identified. The characteristics of patients who self-referred and those who were referred by other medical professionals were compared.

Results: A total of 234 patients were included (mean age 33.7 years, 59.1% male). Most of the injuries occurred during soccer and running, particularly injuries of the knee and ankle. In this cohort, 39.3% of patients consulted a sports physician directly. These patients were significantly more often involved in individual sports, consulted a sports physician relatively rapidly after the onset of injury, and had received significantly less care before this new event from medical professionals compared with patients who were referred.

Conclusion: In this study, 39.3% of patients with sports injuries consulted a sports physician directly without being referred by another medical professional. The profile of this group of patients differed from that of patients who were referred. The specific roles of general practitioners and sports physicians in medical sports care in The Netherlands needs to be defined further.

Keywords: sports injuries, sports medicine physician, primary care, secondary care

Introduction

Nowadays, sports and physical exercise play an important role in our society. Almost 50% of the Dutch population practice sport of some kind, either in a club or as individuals.¹⁻⁵ In addition to the positive effects of sports and physical exercise, sports can lead to injuries which have a negative impact on an active lifestyle.⁶ About 3.5 million sport injuries are registered in The Netherlands each year, of which about 1.4 million are treated clinically. General practitioners see about 50% of clinically treated injuries, and sports medicine physicians are consulted in about 8% of all cases.⁷

Sports medicine has been rapidly developing in The Netherlands, and familiarity with this specialty is increasing. Sports physicians assess sports-related symptoms and are available for assessment of athletes without the need for referral by a general practitioner, which is the normal procedure in primary care in The Netherlands.

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Sports physicians play an increasing role in sports medicine in The Netherlands, such that the annual number of patient contacts with these physicians has increased from 60,000 in 2003 to over 100,000 in 2010.^{3,7–10}

Sports physicians assess patients with sports-related symptoms based on referrals by general practitioners, physiotherapists, and paramedics, but also treat so-called “self-referrers” who consult them on their own initiative and thus bypass their general practitioner. It remains unclear why these athletes consult a sports physician directly. However, with more information about their motives, general practitioners and sports physicians might better adjust their treatment practice to the wishes of patients with sports-related injuries or complaints.

A recent study of sports-related injuries in general practice shows that general practitioners usually record sports-related injuries based on symptoms rather than in a diagnosis-specific way.¹¹ For most sports-related injuries, general practitioners usually give advice and seldom refer the patient to other medical specialists for additional assessment. From the above-mentioned study,¹¹ it is not possible to evaluate whether patients would benefit if general practitioners had a different sports policy, because the severity of the sports-related problems was not registered. This complicates comparison between existing sports-related problems and current sport injuries as seen in a sports physician's office.

Until now, it remains unclear why athletes decide to “refer themselves” to a sports physician without first consulting their general practitioner. Therefore, to obtain more data on the numbers and characteristics of “self-referrers” to sports physicians, the present study compared this subgroup with patients referred to a sports physician via another health professional.

Materials and methods

This study had a cross-sectional design and was based on a selective sample. All new patients visiting the Sports Medical Center at the University Medical Center Groningen during September 2010 were registered in a digital database, based on information collected from their paper and electronic medical records. The patients were divided into four groups: patients referred by a general practitioner (group 1), patients referred by physiotherapists/paramedics, but not a general practitioner (group 2), patients referred by other medical specialists (group 3), and self-referrers (patients visiting on their own initiative without a general practitioner's referral, group 4).

Although patients in group 2 and 4 visited a sports physician without a general practitioner referral, they were considered as two separate groups because group 2 followed a care provider's advice, whereas group 4 consulted a sports physician on their own initiative.

For all groups, age, gender, sports practice, development of complaints, prevalence of sports-related injuries, absence from sport or work, previous treatment of presenting symptoms, additional examinations as requested by the sports physician, and diagnosis and therapeutic interventions were examined. In the present study, the definition of sports injury was extended to include a sports-related injury connected with a previous examination in general practice.¹² All complaints or injuries involving the locomotor system that developed during or outside sporting activities and impeded the patient in his/her sports performance^{3,12–15} were taken into account.

All four groups were compared using analysis of variance (age) and Chi-square tests (gender, sport practice, development of complaints, prevalence of sports-related problems, and absence from sport or work). Prevalence, proportions,

Table 1 Baseline characteristics of the study population by referral group

	Total population (n = 234)	Self-referrers (n = 92)	Referred by GP (n = 98)	Referred by physiotherapist/ paramedic (n = 29)	Referred by medical specialist (n = 15)	P value
Patients consulting a sports physician (%)	100.0	39.3	41.9	12.2	6.5	
Mean age, years (SD)	33.7 ± 14.9	34.6 ± 14.3	32.7 ± 15.3	33.2 ± 16.4	36.1 ± 13.7	0.75 [†]
Gender (% male)	59.1	57.8	56.7	71.4	60	0.56 [‡]
Sport level (% top sport)	6.8	8.9	6.2	4.2	0	0.49 [‡]
Etiology injury (% acute)	43.3	43.8	41.1	50.0	46.7	0.81 [‡]
Previous additional tests (%)	31.4	28.1	28.4	18.5	93.3	0.76 [‡]
Previous treatment (%)	52.9	40.7	55.2	71.4	73.3	0.00 ^{*‡}

Notes: [†]Tested with analysis of variance; [‡]tested with Chi-square test; ^{*}statistically significant.

Abbreviations: GP, general practitioner; SD, standard deviation.

Table 2A Sports practiced by each referral group (%)

	Total population (n = 230)	Self-referrers	Referred by GP	Referred by physiotherapist/ paramedic	Referred by medical specialist
Soccer	26.5	21.1	28.9	42.9	13.3
Running	19.1	28.9	15.5	7.1	6.7
Martial arts	6.1	6.7	5.2	3.6	13.3
Fitness	4.3	2.2	6.2	7.1	0
(Nordic) walking	3.9	3.3	5.2	3.6	0
Bicycle racing	3.0	1.1	5.2	0	6.7
Hockey	2.2	2.2	2.1	3.6	0
Korfbal	2.2	2.2	3.1	0	0
Horse riding	2.2	0	4.1	0	6.7
Other	30.5	32.3	24.5	32.1	53.1

Abbreviation: GP, general practitioner.

and categories of all variables were, when possible, tested between all groups using a two-sided Chi-square test. A P value <0.05 was considered to be statistically significant, using a power of 0.80. In the event that the Chi-square test did not satisfy the required assumptions, only the distribution (without a P level) is shown. Statistical analysis was performed using the Statistical Package for the Social Sciences, version 16.0 for Windows (SPSS Inc, Chicago, IL).

Results

A total of 241 patients consulting for the first time were examined by three sports physicians and one sports physician in training during September 2010. Of these patients, seven were excluded due to missing data and 234 patients were included. Table 1 shows the basic characteristics of the study population by referral group. The mean age of the total population was 33.7 (range 10–77) years. Of all patients, 59.1% were male and 6.8% were professional or high-level athletes. Of the registered sports-related injuries, 43.3% were of an acute nature and the remainder had developed over time.

Referral groups

Self-referrers (group 4) represented 39.3% of incoming patients during the sports physician's consulting hours. All other patients were referred by general practitioners (42.2%),

physiotherapists/paramedics (12.2%), or other medical specialists (6.5%). There were no significant differences in age, gender, or development of injuries between the four groups (Table 1). Referred patients had received significantly more previous treatment for their presenting complaints than the self-referrers ($P = 0.00$).

Types of sports

The sports most often practiced were soccer and running. Compared with patients referred by general practitioners, the self-referrers (group 4) included more runners and fewer soccer players (Tables 2A and 2B) and significantly more athletes practicing individual sports than team sports ($P = 0.049$).

Diagnoses

Table 3 lists the most frequently occurring diagnoses in the total study population. Patellofemoral pain syndrome, Achilles tendinitis, and an anterior cruciate ligament lesion were the most common diagnoses. Of all patients, 48.7% had a knee injury, 17.4% had complaints at/around the ankle, and 11.4% had an injury at the pelvis or thigh.

Absence from sport or work

Table 4 shows the reported absence from sport and/or work. About two-thirds of the patients reported some degree of

Table 2B Team and individual sports practiced by each referral group (%)

	Total population (n = 230)	Self-referrers	Referred by GP	Referred by physiotherapist/ paramedic	Referred by medical specialist	P value
Team sports	37.8	30.0	44.3	50.0	20.0	
Individual sports	36.1	44.4	32.0	28.6	26.7	
Other ⁺	26.1	25.6	23.7	21.4	53.3	$<0.05^{**}$

Notes: ⁺Chi-square test; ^{*}statistically significant; ⁺sports students, inactive patient, sports with teams and individual disciplines.

Abbreviation: GP, general practitioner.

Table 3 Diagnoses determined in the study population by referral group (%)

	Total population (n = 234)	Self-referrers	Referred by GP	Referred by physiotherapist/ paramedic	Referred by medical specialist
Patellofemoral pain syndrome	8.3	6.7	10.3	7.1	6.7
Achilles tendinopathy	6.1	6.7	6.2	0	13.3
ACL lesion	6.1	4.4	7.2	3.6	13.3
Meniscus lesion of knee	5.7	4.4	7.2	7.1	0
Osteoarthritis of knee	3.9	1.1	7.2	3.6	0
Plantar fasciitis	3.9	3.3	4.1	7.1	0
Chondropathy knee/degeneration of meniscus	3.9	7.8	2.1	0	0
Knee distortion with temporary complaints	3.5	4.4	0	10.7	6.7
Pain ankle/foot NOS	3.5	3.3	3.1	3.6	6.7
Proximal patellar tendinopathy	3.5	2.2	2.1	10.7	6.7
Iliotibial band syndrome	3.0	3.3	4.1	0	0
Chronic ankle instability	2.6	1.1	5.2	0	0
Adductor tendinopathy	2.6	2.2	1.0	7.1	6.7
Knee pain NOS	2.6	2.2	3.1	0	6.7
Rotator cuff tendinopathy	2.2	2.2	1.0	7.1	0
Pain hip/upper leg NOS	2.2	1.1	2.1	7.1	0
Other	36.4	43.6	34.0	25.2	33.3

Abbreviations: ACL, anterior cruciate ligament; NOS, not otherwise specified; GP, general practitioner.

absence from sport, compared with only 8.4% being absent from work. Most patients who were absent from sport had stopped practicing for a considerable amount of time. Nevertheless, self-referrers who were absent from sport or work presented to the sports physician at an earlier stage. Of those patients who stopped practicing their sporting activity and who had been referred by their general practitioner, most presented to the sports physician after a longer period of time. However, there were no significant between-group differences regarding absence from sport ($P = 0.11$) or absence from work ($P = 0.52$).

Additional investigations

Table 5 presents an overview of the additional tests that were ordered. Sports physicians frequently requested

additional tests, especially for new injuries. In most cases, these were X-rays (57.4%), magnetic resonance imaging (31.3%), and ultrasound examinations (13.2%).

Treatment

About 50% of the patients were given advice on special exercises or were referred to a physiotherapist or manipulative therapist (Table 6). Self-referrers were less often referred to other therapies; moreover, for 31.5% of these patients, only practical medical advice was given, compared with 15.5% for patients referred by their general practitioners.

Discussion

In this study, 39.3% of patients consulting a sports physician at the Sports Medical Center, University Medical Center

Table 4 Absence from sport and/or work by referral group (%)

	Total population (n = 225)	Self-referrers	Referred by GP	Referred by physiotherapist/ paramedic	Referred by medical specialist	P value
Absence from sport						
None	33.3	37.2	31.2	25.0	40.0	0.11‡
0–1 week	4.9	9.3	2.1	3.6	0	
1–3 weeks	6.2	7.0	5.2	10.7	0	
3–13 weeks	16.9	19.8	17.7	14.3	0	
>13 weeks	38.7	26.7	43.8	46.4	60.0	
Absence from work						
None	66.7	65.2	66.0	78.6	57.1	0.052‡
0–1 weeks	1.3	3.4	0	0	0	
>1 week	7.1	5.6	8.5	3.6	14.3	
Unknown	24.9	25.8	25.5	17.9	28.6	

Note: [‡]Chi-square test.

Abbreviation: GP, general practitioner.

Table 5 Additional tests ordered after consultation (%)

	Total population (n = 230)	Self-referrers	Referred by GP**	Referred by physiotherapist/ paramedic	Referred by medical specialist
X-rays	57.4	51.1	58.8	67.9	66.7
Ultrasound	13.2	10.0	11.3	14.3	20.0
Laboratory tests	1.7	2.2	2.1	0	0
Exercise test	3.0	2.2	4.1	0	6.7
MRI scan	31.3	27.8	34.0	28.6	40.0
CT scan	0.4	0	0	0	6.7
No	25.6	30.0	22.7	25.0	20.0

Note: **Referring medical professional.

Abbreviations: CT, computed tomography; GP, general practitioner; MRI, magnetic resonance imaging.

Groningen, came without a referral from another medical professional. The basic characteristics (age, gender, and level of sport) of the self-referrers were similar to those of other patients visiting the center.

In The Netherlands, patients referred to sports medicine physicians and self-referrers seem to have a different need for care. In general, the referred patients (significantly more often practicing team sports) had previously been treated and were referred to secondary care for further examination. Self-referrers (significantly more often individual athletes) were less likely to have been treated previously for sports-related complaints compared with the referred group. Probably for this reason, self-referrers reported shorter absence from work or sports. They preferred consulting a sports physician rather than a general practitioner in the first instance; however, the reasons for this decision were not explored in this study. It has been reported that general practitioners are less specific in the registration of their diagnosis and advice for sport-related complaints.³ In this study, all patients consulting a sports physician received a specific diagnosis and related treatment.

The patients in the present study corresponded regarding age, gender, and sports performance with demographic data on sport injuries reported by the Dutch National Institute

for Health and Environment and by others examining the prevalence of sport injuries in general practice.³⁻⁶ Therefore, our study population seems to be representative of patients with sport-related injuries in The Netherlands. Soccer and running (the most commonly practiced sports) were responsible for the greatest amount of injuries, and men reported more sports-related injuries than women.

Most patients in this study visited a sports physician with lower limb complaints, mainly involving the ankles and knees. Patients referred by a general practitioner to a sports physician suffered mainly from patellofemoral pain syndrome, whereas self-referrers suffered mainly from intra-articular knee pathology. Apart from that, the overall picture of sports-related injuries was similar between the four groups and corresponds with data from the National Compass Public Health 2009.⁷⁻¹⁶ Unfortunately, we cannot compare our data on diagnoses with other data on the prevalence of sports-related injuries in general practice because only non-diagnosis-specific registration was made in the previous studies.^{3,6}

Our study did not monitor the severity or follow-up of sport-related injuries. Our study group consisted of patients consulting sports physicians at the University Sports Medical Center during September. The specific setting and season

Table 6 Treatment recommendations (%)

	Total population (n = 233)	Self-referrers	Referred by GP	Referred by physiotherapist/ paramedic	Referred by medical specialist
Sports medical advice	22.7	31.5	15.5	17.9	13.3
Physiotherapy/manual therapy/exercises	54.4	46.0	62.5	50.0	60.0
Referral (orthopedic) surgeon	19.2	14.6	22.7	17.8	26.7
Medication	10.0	12.2	8.2	14.3	0
ESWT	10.0	10.1	5.2	21.4	20.0
Brace/insole/bandage	9.6	7.9	13.4	7.1	0
Referral to other medical specialist	5.6	4.4	6.2	0	20.0
Injection of corticosteroids	1.3	0.4	0.4	0.4	0

Abbreviations: ESWT, extracorporeal shockwave therapy; GP, general practitioner.

may have influenced patient characteristics, in which case this population may not be representative of all patients with sports-related problems in The Netherlands. Some of the self-referred patients may have consulted their general practitioners, team physicians, or other therapists in the past, which may have affected the outcome of our study.

Conclusion

Self-referrers represent an important proportion (39.3% in this study) of a growing patient population with sports-related injuries consulting sports physicians in The Netherlands. In our study, although the baseline characteristics of self-referrers were similar, their profiles differed from those of patients who were referred to a sports physician. Self-referrers can be broadly characterized as having relatively new complaints and more frequently engaging in individual sports. Their reasons for bypassing the general practitioner to consult a sports physician directly remain unclear. More knowledge on these motives might answer the question whether, in the case of sports-related injuries, a direct specific evaluation by a sports physician has additional value, or whether the general practitioner could filter sports-related problems in the first instance, with the sports physician in the background as a second-line clinical specialist.

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Disclosure

The authors report no conflicts of interest in this work.

References

1. Bernaards C, Toet H, Chorus A. Medical costs of being less active. In: Breedveld K, Kamphuis C, Tiessen-Raaphorst A, editors. *Report on Sports. Social and Cultural Planning Office*. The Hague, The Netherlands: WJH Mulier Institute; 2008. Dutch.
2. Ooijendijk WTM, Jongert T, Stubbe J, Kloet S. Sports, exercise and health. In: Breedveld K, Kamphuis C, Tiessen-Raaphorst A, editors. *Report on Sports. Social and Cultural Planning Office*. The Hague, The Netherlands: WJH Mulier Institute; 2008. Dutch.
3. Baarveld F, Visser CAN, Kollen BJ, Backx FJG. What is the role of the general practitioner in sports related injuries? *Huisarts en Wetenschap*. 2010;53:601–604. Dutch.
4. Schmikli SL, Backx FJ, Kemler HJ, van Mechelen W. National survey on sports injuries in The Netherlands: target populations for sports injury prevention programs. *Clin J Sport Med*. 2009;19:101–106.
5. Schmikli SL, Schoots W, De Wit MJP. Sports injuries, a broad overview. Arnhem, The Netherlands: National Sports Centre Papenda; 2002. Dutch.
6. Valkenberg H, Donker W, Schoots W, Vriend I. Sports injuries in the general practice: registration, treatment and referral policy. *Sport en Geneeskunde*. 2010;2:6–14. Dutch.
7. Schoots W, Vriend I, Stam C, Kloet S. Sports injuries in The Netherlands: a new overview. *Sport en Geneeskunde*. 2009;42:16–23. Dutch.
8. Breedveld K, De Jong M, Stuij M. Monitoring/evaluation of sports policy by the Ministry of Health, Welfare, and Sports: interim report 2008. The Hague, The Netherlands: WJH Mulier Institute; 2008. Dutch.
9. Dutch Federation of Sports Medical Institutions. [Document FED 2034: patient contacts in sports medical institutions in 2010 in The Netherlands]. Bilthoven, The Netherlands: Dutch Federation of Sports Medical Institutions; 2011. Dutch.
10. Ministry of Health, Welfare, and Sports. [Ministerial note “Time for sports and exercise and to participate and to perform”]. The Hague, The Netherlands: Ministry of Health, Welfare, and Sports; 2005. Dutch.
11. Baarveld F, Visser CAN, Kollen BJ, Backx FJG. Sports-related injuries in primary health care. *Fam Pract*. 2011;28:29–33.
12. Baarveld F. Sports related injuries in general practice. Dissaertation. Groningen, The Netherlands: University Medical Center Groningen; 2004. Dutch.
13. Ministry of Health, Welfare and Sports. [To an active government policy to increase health with sports and exercise]. The Hague, The Netherlands: Ministry of Health, Welfare and Sports; 2001. Dutch.
14. Burt CW, Overpeck MD. Emergency visits for sports-related injuries. *Ann Emerg Med*. 2001;37:301–308.
15. van Mechelen W. The severity of sports injuries. *Sports Med*. 1997;24:176–180.
16. Lanting LC, Stam C. How often do we see sports injuries and what's the severity of these injuries? Future Exploration of Public Health, National Health Compass. Bilthoven, The Netherlands: National Institute for Public Health and Environment; 2009. Dutch.

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