

Diagnostic concordance between primary care physicians and rheumatologists in patients with work disability related to musculoskeletal disorders

Gloria Candelas · Lydia Abasolo · Leticia Leon · Cristina Lajas · Estibaliz Loza ·
Marcelino Revenga · Javier Bachiller · Paz Collado · Patricia Richi ·
Margarita Blanco · Juan A. Jover

Received: 10 February 2010 / Accepted: 1 May 2010 / Published online: 19 May 2010
© Springer-Verlag 2010

Abstract To assess the diagnostic correlation between primary care physicians and rheumatologists in patients with temporary work disability (TWD) related to musculoskeletal diseases (MSD). All patients with TWD related to MSDs in three health districts of Madrid, Spain, were randomized into standard care by primary care physicians (PCP) or the intervention group by rheumatologists. According to the cause, every TWD episode was classified into 11 syndrome categories. To examine the concordance between the rheumatologist and the referring PCP for each diagnosis, we used Kappa statistic (k) and 95% confidence interval (CI). A total of 3,311 (62.8%) were analyzed, 49.8% women, with a mean age of 41 years \pm 12 years, 93.3% were general workers. The agreement between PCP and rheumatologists in all the diagnoses was moderated ($k = 0.62$). The highest agreement was found in tendonitis ($k = 0.81$, 95% CI 0.78–0.84), and microcrystalline and undifferentiated arthritis ($k = 0.72$, 95% CI 0.68–0.77). Lowest agreements were found for peripheral osteoarthritis ($k = 0.48$, 95% CI 0.38–0.57), knee pain ($k = 0.40$, 95% CI

0.29–0.52), and muscular pain ($k = 0.15$, 95% CI 0.10–0.20). Although the global agreement on the musculoskeletal diagnosis between PCPs and rheumatologist in patients with TWD related to MSDs was reasonable, the correlation for peripheral osteoarthritis, knee pain, and muscular pain was low.

Keywords Concordance · Diagnosis · Work disability · Musculoskeletal

Introduction

Musculoskeletal disorders (MSDs) have a high incidence and prevalence [1–3]. It is estimated that 16% of the total population and 21% of people older than 18 years in Canada and USA had musculoskeletal health problems, mainly secondary to back pain or joints [4]. In Spanish population, 30–50% of them had joint symptoms and 20% had low back pain [5, 6]. MSDs are also characterized by a great comorbidity and are one of the main causes of activity restriction, functional loss, and short- or long-term disability [3, 7–9]. As a consequence, MSDs generate high demand in health care resources and social services [7–10] and produce a great socioeconomic impact in Western countries [8]. In terms of health care utilization, MSDs suppose at least 10% of all the medical visits to primary care physicians and 15% of them are referred to the rheumatologist [7–10].

MSDs in the workplace have a huge impact, as they are one of the most common causes of transitory work restriction or temporary work disability (TWD) and the main cause of long-term or permanent work disability (PWD) [9–13]. In fact, in our country, temporary work disability related to MSDs accounts for 20% of sick-leave days [12].

G. Candelas · L. Abasolo · L. Leon (✉) · C. Lajas · M. Blanco ·
J. A. Jover
Hospital Clínico San Carlos, Madrid, Spain
e-mail: leticialleonmateos@hotmail.com

E. Loza
Research Unit, Fundación Española
de Reumatología, Madrid, Spain

M. Revenga · J. Bachiller
Hospital Ramón y Cajal, Madrid, Spain

P. Collado
Hospital Severo Ochoa, Madrid, Spain

P. Richi
Hospital Infanta Sofia, Madrid, Spain

Ten years ago, our research group launched an early community-based intervention program offered to workers with temporary work disability related to MSDs. This clinical program was carried out by trained rheumatologists and included disease-specific educational, clinical, and administrative proceedings.

We compared the efficacy and costs of such care program with the standard health care, which involves primary care physicians (PCPs) and referral to specialized care if necessary. Our results show that patients with recent onset MSD-TWD, included in the specific intervention care program ($n = 5,272$), were able to return to work earlier and progressed less to permanent work disability than those who followed the current care system ($n = 7,805$). Another important point is that early referral to rheumatologists could improve TWD patients outcomes in terms of short- and long-term disability [13]. Although the maximum effect of the program always took place within the first 2 months, each diagnosis had its own time period.

In many countries, PCPs are generally the initial health care contact for patients with TWD related to MSDs. A number of health-related decisions and interventions can arise from their diagnoses including referrals, diagnostic test, therapies, and patient counselling. Thus, an early and correct diagnosis would be necessary in order to improve patient's outcomes and health care resource utilization. The reported diagnostic concordance between primary care physicians (PCP) and rheumatologists in a general outpatient setting is variable and in general low [14–19]. However, there is scarce literature in this field.

Thus, the purpose of the present analysis is to examine the diagnostic concordance between primary care physicians and rheumatologists in patients with TWD related to MSD attended in our specialized care program.

Methods

Setting

Of the 5.5 million persons in Madrid, Spain, 98% receive health coverage from the Instituto Madrileño de Salud. Care is organized into 11 health districts. Patients have direct access to primary care physicians, who refer patients to specialized care when needed. Any worker who requires sick leave is given a temporary work disability initiation form by the primary care physician and entitles the worker to receive compensation payments.

Study design

We conducted a descriptive analysis nested on the specific intervention Program offered to workers with recent MSDs-

TWD from 1998 to 2001 [13, 20]. This intervention study was approved by the ethics committees of the participating hospitals.

Subjects

All patients from health areas 4, 7, and 9 of Madrid Community, who began sick leave with a diagnosis of a MSD during the study period, except for those related to trauma, surgery or work accident, were included. They were randomized into control (CG) and intervention groups (IG). CG patients followed the standard care, and the IG patients were invited to be attended in a specific care program carried out by trained rheumatologists that acted as principal care providers. In this group, the visits were structured following specific proceedings for the different diagnoses based on previously demonstrated approaches [14–18]. Such proceedings included education [13–24], pharmacologic and non-pharmacologic treatment [25], and timing of diagnostic tests. The program also incorporated administrative duties such as the prescription of medication and the filling out of the corresponding temporary work disability forms by the patients. Patients were seen as often as necessary until the episode of temporary work disability was resolved or recovery was deemed unrealistic.

Inclusion and randomization of patients took place during the first year of the study in each district, and follow-up was prolonged for another full year. Patients maintained their group assignments in the successive episodes of MSD-related temporary work disability during follow-up. Patients who were assigned to the intervention group but were unable or unwilling to participate, were already working, or could not be located were considered to be assigned to the intervention group throughout the study for statistical purposes.

Data of TWD episodes, age, gender, and type of work were collected from the National Institute of Social Security. Every TWD episode had assigned a diagnostic code (ICD-9 coding system) according to the cause of TWD reported by the primary care physician prior to the randomization. The diagnosis of all patients seen in the intervention program was revised and modified by the rheumatologist if necessary.

Patients selected for this study were those who had been attended by the rheumatologists in the intervention program including all episodes with no missing data in TWD cause by the PCP or by the rheumatologist.

Variables

Both TWD causes given by the PCPs and also by the Rheumatologist were grouped into 11 syndrome categories based on clinical management and localization of the MSD:

Table 1 Sociodemographic and work-related characteristics of the study population

Variables	%
Age (mean \pm SD years)	41 \pm 12
Sex (women)	49.7
Marital status	
Married	64.7
Divorced	4.6
Single	28.4
Widowed	
Educational level	
None	1.6
Primary school	41.7
Secondary school	42.8
University	13.8
Any comorbidity	24.7
Employment regimen	
Self-employers	6.7
General workers	93.3
Job stability	
Temporary contract	19.6
Indefinite contract	75.7
Functionary	4.7
Work type	
Management/intellectual	7.6
Services	22.3
Secretarial	25.7
Specialized or no specialized manual work	44.4
Unemployed	1.3

“neck pain”, “back pain” (low back pain and thoracic back pain), “sciatica” (discopathies, and sciatica), “muscular pain” (contractures, joint pain without arthritis, fibromyalgia, and other muscle disorders), “peripheral osteoarthritis”, “tendonitis” (tendonitis/bursitis, peripheral sprains, tenosinovitis, and ganglions), “inflammatory diseases” (rheumatoid arthritis, spondyloarthropaties, systemic lupus erythematosus, and vasculitis), “microcrystalline and undifferentiated arthritis”, “knee pain (not osteoarthritis)”, “carpal tunnel syndrome”, and “other” (avascular necrosis, osteoporosis, other neuropathies, complex regional pain syndromes, infections, fractures, tumors, Paget’s bone disease, or osteomalacia). Sociodemographic and work-related variables registered were age, gender, marital status, educational level, employment regimen, job stability, work type, unemployed. All of them were defined in Table 1.

To describe the study sample, we used either the distribution of frequencies or the mean plus minus the standard deviation. To assess the concordance between the rheumatologist and the referring PCPs for each diagnosis, we used Kappa statistic (k) and 95% confidence interval (CI). A

Kappa coefficient ≥ 0.7 was considered to indicate substantial agreement. Analyses were performed with Stata 9.0 (StataCorp, College Station, TX).

Results

A total of 3,311 patients attended the intervention program. They generated 4,424 MSD-related TWD episodes during the 2 years of the study, of whom, 3,713 were seen by the rheumatologists and 2,994 episodes of them had both diagnoses and so were analyzed (Fig. 1).

As exposed in table around 50% were women, with a mean age of 41 \pm 12 years. Two-thirds were married (64.7%), and 80% of them had primary or secondary school education. Most of them (93.3%) were general workers with indefinite contract (75.7%). A total of 1.3% of the patients were unemployed.

The leading causes of TWD (according to the diagnoses given by the rheumatologists) were back pain (33.9%), followed by tendonitis (21.5%), and sciatica (17.9%) (Table 2). In the present study, the overall agreement between PCP and rheumatologists in all the diagnoses was moderated ($k = 0.62\%$) (Fig. 2). However, it varied depending on specific diagnoses. We observed high agreement in the diagnoses of tendonitis ($k = 0.81\%$, 95% CI 0.78–0.84), microcrystalline and undifferentiated arthritis ($k = 0.72$, 95% CI 0.68–0.77), inflammatory diseases ($K = 0.69\%$, 95% CI 0.58–0.78), and carpal tunnel syndrome ($k = 0.68\%$, 95% CI 0.51–0.80), and the lowest agreements were found in peripheral osteoarthritis ($k = 0.48\%$, 95% CI 0.38–0.57), knee pain ($k = 0.40\%$, 95% CI 0.29–0.52), and muscular pain ($k = 0.15\%$, 95% CI 0.10–0.20). When we

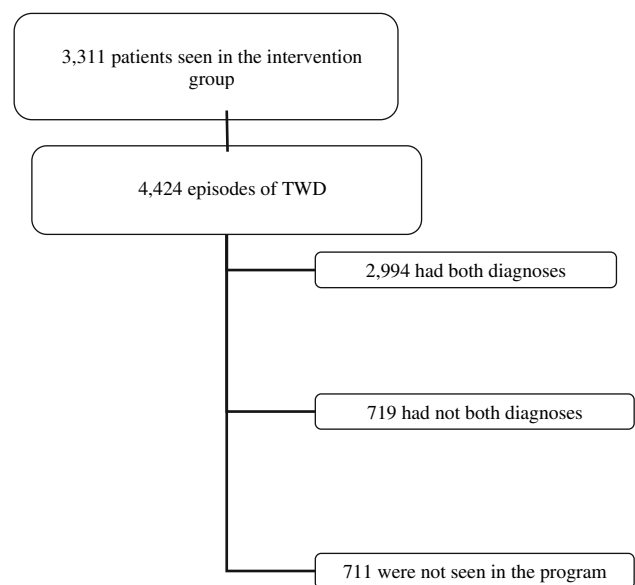
**Fig. 1** Flow chart

Table 2 Cause of musculoskeletal disorder-related temporary work disability

	Value (%)
Back pain	33.94
Tendonitis	21.44
Sciatica	17.94
Neck pain	12.02
Microcrystalline + undifferentiated arthritis	5.79
Joint or muscle pain	2.24
Peripheral osteoarthritis	2.07
Knee pain with no osteoarthritis	1.94
Inflammatory disease	1.51
Carpal tunnel syndrome	0.65
Others	0.46

observed each diagnosis given by PCPs (with detail), we found that 17% patients with carpal tunnel syndrome were diagnosed of tendonitis. In the case of peripheral osteoarthritis, 26% of these subjects were diagnosed of muscular pain and among patients with knee pain, 28 and 17% were diagnosed of muscular pain and of tendonitis, respectively. Moderate agreement was observed for neck pain ($k = 0.65\%$, 95% CI 0.61–0.68), back pain ($K = 0.62$, 95% CI 0.60–0.65), and sciatica ($K = 0.51$, 95% CI 0.47–0.54). In these cases, when we observed with detail PCPs diagnoses, we found that among patients with neck pain, 16 and 13% of these subjects reported a diagnosis of muscular pain and back pain, respectively. Among patients with sciatica, 30% were diagnosed of back pain by the PCP.

Discussion

Our results showed that the global agreement on the musculoskeletal diagnosis between PCPs and rheumatologist in patients with TWD related to MSDs was substantial. However, there were differences according to specific diagnoses.

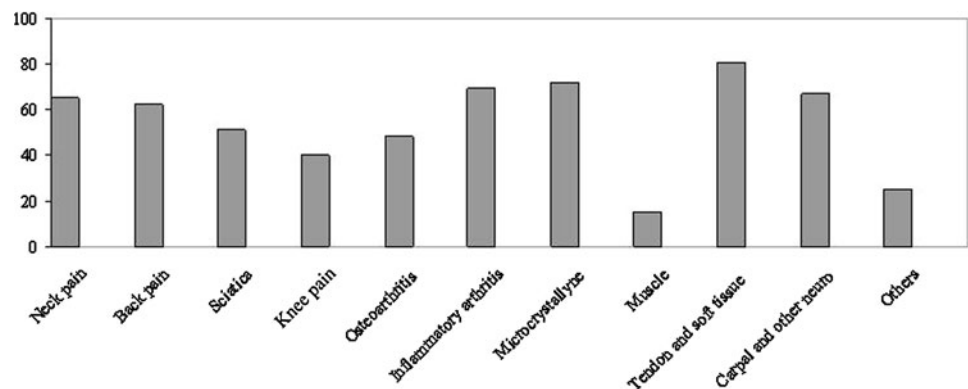
The included subjects were representative of the TWD related to MSD. Most of them were middle-aged man or woman, employed by others, with back pain or soft-tissue rheumatism.

Both PCP and rheumatologists used the International Classification of Diseases, Ninth Revision (ICD-9) coding system to assess diagnoses, to increase the reliability of the diagnoses correlations.

In outpatient settings, the reported diagnostic concordance between PCPs and rheumatologist in the referred patients is in general low [26, 31]. However, in our study, the overall agreement was significant. This could be because we specifically analyzed patients with TWD related to MSD, and more than a half of the subjects reported back pain and tendonitis, which (in this context) are usually acute and disabling processes with clear and specific signs and symptoms. Besides, most were young workers thus probably with low prevalence of other comorbidities that could complicate the diagnoses.

However, when analyzing specific diagnostic categories, we found some differences. The agreement between PCPs and rheumatologists was high in the diagnoses of tendonitis, microcrystalline and undifferentiated arthritis, inflammatory diseases, tunnel carpal syndrome, and neck and back pain. Similar results have been published in outpatient settings except for inflammatory diseases, which showed a low agreement [27–30]. This discrepancy could be due to that just 1.2% of the subjects in the present analysis reported any inflammatory disease. Thus, probably a small sample size to detect differences.

Even though the agreement was slightly low for sciatica, it was clearly low related to peripheral osteoarthritis, knee pain, and muscular pain. Most of these patients were diagnosed of tendonitis or muscular pain according to their PCPs. These findings could reflect as a consequence of their high workload in their daily practice. PCP do not have time to make a detailed clinical history and a physical examination (for example to properly identify patients with neuropathies). Moreover, PCPs may have also problems due to lack of knowledge to identify and/or make a diagnosis

Fig. 2 Concordance between rheumatologists and primary care physicians on every syndrome category

approach at locations where joint-, muscle-, or tendon-related conditions are common (for example at the knee). Knee examination is very technical, and training is necessary in the diagnosis process.

Another relevant question is necessary to consider. Primary care physicians generally are the first health care contact for patient with rheumatic diseases. A number of health-related decisions and interventions can arise from their diagnoses: referrals, diagnostic tests, therapies, and patient counselling. Inadequate diagnoses and treatment can contribute to inappropriate and inefficient resource utilization. In addition, a delay in the diagnosis may result in a lower response to therapy, disease progression, and disability in the patient.

Previously, we had been demonstrated that a program based on simple clinical protocols, in our case run by rheumatologists, is highly effective in reducing the burden of MSDs in the working population, and that such intervention is dramatically effective in specific diagnoses within the first 2 months of disability. Our findings suggest that implementing this type of specialist-run, protocol-based early intervention program would be very beneficial in the treatment of most patients with work disability related to MSDs, except for those with knee pain who would need different approaches [13].

This program was targeted at the active working population. Similar programs could be useful for other persons in the population with recent disability due to MSD, such as housewives, or individuals who have retired. Almost certainly, the socioeconomic impact of MSDs could also be reduced, although further studies would be necessary [32].

In conclusion, nowadays in many countries, PCPs are generally the initial health care contact for patients with rheumatic diseases including patients with TWD related to MSD. Nevertheless, as we have shown, PCPs may have difficulties in the diagnosis of some musculoskeletal disorders, probably because of lack of knowledge or time to proper interview and examine patients. Therefore, an increased emphasis in medical education on the assessment of musculoskeletal disorders and time to proper do it is suggested to improve the efficiency of treatment and/or referrals to rheumatologists of patients with TWD related to MSD.

Conflict of interest statement The authors declare that they have no conflict of interest.

References

- Lawrence RC, Helmick CG, Arnett FC, Deyo RA, Felson DT, Giannini EH et al (1998) Estimates of the prevalence of arthritis and selected musculoskeletal disorders in the United States. *Arthritis Rheum* 41:778–799
- Lee P, Helewa A, Smythe HA, Bombardier C, Goldsmith CH (1985) Epidemiology of musculoskeletal disorders (complaints) and related disability in Canada. *J Rheumatol* 12:1169–1173
- Centers for Disease Control and Prevention (CDC), Centers for Disease Control and Prevention (CDC) (2001) Prevalence of disabilities and associated health conditions among adults: United States, 1999 [published erratum appears in *MMWR Morb Mortal Wkly Rep* 2001;50:149]. *MMWR Morb Mortal Wkly Rep* 50:120–125
- Lee P, Helewa A, Smythe H, Bombardier C, Goldsmith C (1985) Epidemiology of musculoskeletal disorders (complaints) and related disability in Canada. *J Rheumatol* 12(6):1169–1173
- Ballina F, Hernández R, Martín P, Fernández J, Cueto A (1994) Epidemiology of musculoskeletal complaints and use of health services in Asturias, Spain. *Scand J Rheumatol* 23:137–141
- Carmona L, Ballina F, Gabriel R, Laffon A (2001) The burden of musculoskeletal diseases in the general population of Spain: results from a national survey. *Ann Rheum Dis* 60:1040–1045
- Badley EM, Rasooly I, Webster GK (1994) Relative importance of musculoskeletal disorders as a cause of chronic health problems, disability, and health care utilization: findings from the 1990 Ontario Health Survey. *J Rheumatol* 21:505–514
- Van Schaardenburg D, Van den Brande KJ, Ligthart GJ, Breedveld FC, Hazes JM (1994) Musculoskeletal disorders and disability in persons aged 85 and over: a community survey. *Ann Rheum Dis* 53:807–811
- Allaire SH (2001) Update on work disability in rheumatic diseases. *Curr Opin Rheumatol* 13:93–98
- Felts W, Yelin E (1989) The economic impact of the rheumatic diseases in the United States. *J Rheumatol* 16:867–884
- Fautrel B, Guillemin F (2002) Cost of illness studies in rheumatic diseases. *Curr Opin Rheumatol* 14:121–126
- Blanco M, Candelas G, Molina M, Banares A, Jover JA (2000) Characteristics of temporary work disability of musculoskeletal origin in the Madrid autonomous community during a year. *Rev Esp Reumatol* 27:48–53 (In Spanish)
- Abasolo L, Blanco M, Bachiller J, Candelas G, Collado P, Lajas C et al (2005) A health system program to reduce work disability related to musculoskeletal disorders [published erratum appears in *Ann Intern Med* 2005;143:W165]. *Ann Intern Med* 143:404–414
- Frank J, Sinclair S, Hogg-Johnson S, Shannon H, Bombardier C, Beaton D et al (1998) Preventing disability from work-related low-back pain: new evidence gives new hope if we can just get all the players onside. *CMAJ* 158:1625–1631
- Borestein DG, Wiesel SW, Boden SD (1995) Low back pain: medical diagnosis and comprehensive management. WB Saunders Company, Philadelphia
- Malmivaara A, Hakkinen U, Aro T, Heinrichs ML, Koskeniemi L, Kuosma E et al (1995) The treatment of acute low back pain: bed rest, exercises, or ordinary activity? *N Engl J Med* 332:351–355
- Canoso JJ (1997) Rheumatology in primary care. WBSaunders Company, Philadelphia
- Sheon RP, Moskowitz RW, Goldberg VM (1996) Soft tissue rheumatic pain: recognition, management and prevention. Williams & Wilkins, Baltimore
- McKenzie R (1983) Treat your own neck. Spinal Publications, Raunati Beach (New Zealand)
- Dalton SE (1994) The conservative management of rotator cuff disorders. *Br J Rheumatol* 33:663–667
- Warhold LG, Osterman AL, Skirven T (1993) Lateral epicondylitis: how to treat it and prevent recurrence. *J Musculoskelet Med* 10:55–73
- Canoso JJ (1990) Bursitis, tenosynovitis, ganglions, and painful lesion of the wrist, elbow, and hand [review]. *Curr Opin Rheumatol* 2:276–281

23. Nordin M, Andersson GB, Pope MH (1997) *Musculoskeletal disorders in the workplace: principles and practice*. Mosby, St. Louis
24. NIH Consensus Development Panel on Physical Activity and Cardiovascular Health (1996) Physical activity and cardiovascular health [review]. *JAMA* 276:241–246
25. Kelly W, Harris ED, Ruddy S, Sledge C (1996) *Textbook of rheumatology*. WB Saunders Company, Philadelphia
26. Sanchez Molla M, Tovar J, Medina MA (1994) Diagnostic consistency between primary care physicians and rheumatologists. *Aten Primaria* 13:446–448
27. Gamez-Nava JI, Gonzalez-Lopez L, Davis P, Suarez-Almazor ME (1998) Referral and diagnosis of common rheumatic diseases by primary care physicians. *Br J Rheumatol* 37:1215–1219
28. Bolumar F, Ruiz MT, Hernandez I, Pascual E (1994) Reliability of the diagnosis of rheumatic conditions at the primary health care level. *J Rheumatol* 21:2344–2348
29. Bjelle A, Magi M (1981) Regional rheumatology practice in Umea a northern Swedish experience. *J Rheumatol* 8:110–118
30. Sverdrup B, Allebeck P, Allander E (1983) Tentative diagnoses among referrals versus diagnoses established at the Department of Rheumatology. *Scand J Rheumatol* 12:377–378
31. Gran JT, Nordvag BY (2000) Referrals from general practice to an outpatient rheumatology clinic: disease spectrum and analysis of referral letters. *Clin Rheumatol* 19:450–454
32. Abasolo L, Carmona L, Hernandez-Garcia C, Lajas C, Loza E, Blanco M et al (2007) Musculoskeletal work disability for clinicians: time course and effectiveness of a specialized intervention program by diagnosis. *Arthritis Rheum* 57:335–342