Musculoskeletal system assessment in an emergency room

Sonia Cristina de Magalhães Souza Fialho[1], Gláucio Ricardo Werner de Castro[2], Adriana Fontes Zimmermann[2], Giovana Gomes Ribeiro[1], Fabrício Souza Neves[1], Ivânio Alves Pereira[3], Guilherme Loureiro Fialho[4]

ABSTRACT

Objective: Musculoskeletal conditions have an enormous and growing impact worldwide. In spite of that, some clinicians are not confident in their own musculoskeletal examination skills. This study aimed to evaluate the prevalence of musculoskeletal symptoms in an emergency room, and the frequency of musculoskeletal physical examination description on those cases. **Methods:** This was a cross-sectional study. We performed a systematic analysis of medical files at the emergency room of the University Hospital of the Federal University of Santa Catarina, Brazil, from April 24th to 30th, 2009. **Results:** We analyzed 392 files, where 41.5% of patients were male and mean age was 38.7 ± 17.2 years-old. Sixty nine out of 392 patients (17.6%) presented with a musculoskeletal complaint. The most common musculoskeletal complaint was low back pain (33/69). Only 49.2% of patients with a musculoskeletal chief complaint had a specific physical examination registered on the files. Patients with musculoskeletal complaints had lower registrations of abdominal examination (46% *versus* 62%, P = 0.01) and vital signs (46% *versus* 66%, P = 0.002), but a higher frequency of musculoskeletal examination registration (49% *versus* 0.6%, P = 0.00). **Conclusions:** Our study confirms other observations worldwide. Musculoskeletal complaints are frequent in a emergency room setting and in spite of that it is suggested that musculoskeletal symptoms are poorly evaluated, which is probably related to an insufficient musculoskeletal education. It is essential that medical schools place more emphasis on these conditions so that young physicians will be more prepared to deal with these common diseases.

Keywords: musculoskeletal system, physical examination, education, medical, graduate, diagnosis, rheumatic diseases.

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INTRODUCTION

Musculoskeletal conditions have an enormous and growing impact worldwide. They are the most common cause of chronic pain and physical inabilities.[1] Musculoskeletal impairments ranked number one in chronic impairments in the United States, and chronic musculoskeletal pain is reported in surveys by 1 in 4 people in both less and more developed countries.[1] In addition, musculoskeletal conditions were the most expensive disease category in a Swedish cost of illness study, representing 22.6% of the total cost of illness.[1] Also, with population growth and increased longevity, the burden is increasing.

Surveys of the workload of general practitioners (GPs) have shown that between 15 and 20% of all consultations are for disorders of the musculoskeletal system.[2] In spite of that, patients with musculoskeletal conditions are frequently underappreciated by the health system. We believe that occurs for several reasons including that they are rarely fatal, are considered irreversible, and also probably because of the inappropriate musculoskeletal education provided by medical schools.

The education of medical students in rheumatic diseases is often insufficient and warrants careful reconsideration.[2-5] Consequently, it is not surprising to find that some practicing clinicians are not confident in their own musculoskeletal examination skills; many wish that they had had more musculoskeletal training and some do not regard this as a part of their routine medical practice.[6]

Rheumatologists agree that competence in the examination of the musculoskeletal system is essential for all medical students at the point of qualification from medical school. Defining that competence and the exact skills required may provoke more disagreement. However, most would consent that every musculoskeletal education program should provide students with minimal tools to allow a good clinical practice in an emergency room, since musculoskeletal complaints are

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Universidade Federal de Santa Catarina – UFSC, Brazil.
1. PhD in Sciences by the Universidade de São Paulo – USP; Assistant physician at the Rheumatology Department of the UFSC
2. Master in Sciences by the UFSC; Assistant physician at the Rheumatology Department of the UFSC
3. PhD in Sciences by the USP; Chief-assistant at the Rheumatology Department of the UFSC
4. Master in Sciences by the Hospital do Servidor Público Estadual de São Paulo; Assistant physician at the Unit of Cardiology of the UFSC
Correspondence to: Sonia Cristina de Magalhães Souza Fialho. Rua Virgílio Várzea, 1.510, Bloco H, 101. Florianópolis, SC, Brazil. Zip Code 88032-001.
E-mail: fialhoson@gmail.com

supposedly frequent in these settings and many newly doctors begin their practice in those locations.

This study evaluated the prevalence of musculoskeletal symptoms in an emergency room, and the frequency of musculoskeletal physical examination description on those cases. We also performed a secondary analysis comparing patients with musculoskeletal complaints and patients with skin complaints (considered to be of low clinical gravity) in order to identify if possible files registrations differences found in our primary analysis were related to the characteristics of a consultation in an emergency room.

MATERIAL AND METHODS

This was a cross-sectional study. We performed a systematic analysis of medical files of patients consulted at the emergency room of the University Hospital of Santa Catarina (a tertiary center with an open door policy) from April 24th to 30th, 2009. Medical consultations at this unit are performed by residents in Internal Medicine and medical students (5th and 6th academic years) under the supervision of another doctor (general practitioner) with at least two years of residency in Internal Medicine.

The protocol evaluated registrations of the following: name, day and time of consultation, age, gender, chief complaint, physical examination (vital signs, cardiovascular, respiratory, abdominal, and musculoskeletal), laboratory exams, radiographic exams and diagnostic hypothesis.

Patients were divided in two groups: with and without musculoskeletal complaints. Groups were compared for several points concerning files registrations.

After, a secondary analysis was performed comparing patients with musculoskeletal complaints and patients with skin complaints (considered to be of low clinical gravity). The objective of this analysis was to identify if possible files registrations differences found in our primary analysis were related to the characteristics of a consultation in an emergency room, which are directed to urgent illness.

Variables normally distributed were compared using student's T test. Categorical data among groups were compared by Fisher exact test. A statistical significance was set at $P < 0.05$. All statistical analyses were performed using NCSS software.

This study received institutional review and was approved by the Ethics Committee on Human Being Research of the Federal University of Santa Catarina, Brazil (FR- 279051).

RESULTS

We analyzed 392 files, where 41.5% of patients were male and mean age was 38.7±17.2 years-old.

Table 1 shows the prevalence of chief complaints reported by the patients at the moment of consultation. Sixty nine out of 392 patients (17.6%) presented with a musculoskeletal complaint.

Table 1
Prevalence of chief complaints reported at consultation

Chief complaint	Number of patients (%) N = 392
Musculoskeletal	69 (17.6)
Abdominal pain	56 (14.3)
Headache	36 (9.2)
Skin lesions	34 (8.7)
Thoracic pain	27 (6.9)
Ear and nose symptoms	25 (6.4)
Dyspnea	21 (5.3)
Fever	15 (3.8)
Genitourinary	13 (3.3)
Cough	13 (3.3)
Vomit or diarrhea	11 (2.8)
Syncope or palpitation	7 (1.8)
"Flu-like"	6 (1.5)
Eyes symptoms	3 (0.8)
Others	56 (14.3)

Musculoskeletal complaints are demonstrated at Table 2. The most common musculoskeletal complaint was low back pain (33/69), followed by dorsalgia (9/69).

Table 2
Musculoskeletal complaints reported at consultation

Musculoskeletal complaint	Number of patients N = 69
Low back pain	33
Dorsalgia	9
Shoulder pain	6
Foot pain	4
Leg pain	3
Hip pain	2
Cervicalgia	2
Myalgia	2
Knee pain	2
Hands paresthesia/pain	2
Polyarthralgia	1
Buttocks pain	1
Elbow pain	1
Wrist pain	1

Table 3
Registered file data in patients with and without musculoskeletal and skin complaints

	Musculoskeletal N = 69	Others N = 323	P	Skin N = 34	P
Age*	40.5 ± 17.2	38.4 ± 17.2	0.35	36.2 ± 18.4	0.24
Male, (%)	42	41	1.00	44	1.00
Cardiac& (%)	71	78,6	0.20	50	0.05
Respiratory& (%)	74	77	0.64	50	0.02
Abdominal& (%)	46	62	0.01	32	0.20
Vital signs (%)	46	66	0.00	41	0.67
Musculoskeletal& (%)	49	0,6	0.00	0	0.00
Radiography (%)	15	16	1.00	2	0.09
Laboratory (%)	14	21	0.24	14	1.00
Diagnosis hypothesis (%)	45	50	0.50	55	0.4

*Data are expressed as means and standard deviations; & refers to organ physical examination.

Table 3 shows the data comparing patients with and without musculoskeletal complaints. Only 49.2% of patients with a musculoskeletal chief complaint had a specific musculoskeletal physical examination registered on the files. When considering only patients with low back pain (the most common musculoskeletal complaint) only 27% had their physical examination registered. By contrast, 50 out of the 56 patients who presented with abdominal pain had their abdominal examination registered. Patients with musculoskeletal complaints had lower registrations of abdominal examination (46% versus 62%, P = 0.01) and vital signs (46% versus 66%, P = 0,00), but a higher frequency of musculoskeletal examination registration (49% versus 0.6%, P = 0.00). In Table 3, we also demonstrate data comparing patients with musculoskeletal and skin complaints. All patients with skin complaints had a cutaneous examination described on files. Patients with musculoskeletal symptoms had a higher frequency of cardiac and respiratory examination registration (71% versus 50%, P = 0.049; 74% versus 50%, P = 0.02, respectively).

DISCUSSION

Our study demonstrated a high prevalence of musculoskeletal complaints in an emergency room at a University Hospital in Brazil. Similarly, two other studies reported a high prevalence of those symptoms in a primary health care setting. Colombo et al. found 13.5% of musculoskeletal complaints in a working day in a primary care unit.[7] Another study found that musculoskeletal pain was the most prevalent symptom in 1,306 investigated patients (10.64%).[8] In the United States and Canada, musculoskeletal symptoms are responsible for approximately 15% to 30% of primary care units visits;[4] in the United States, 20% of emergency rooms consultations are for musculoskeletal complaints.[9]

Interestingly, only 49.2% of patients with musculoskeletal symptoms had a registration of the musculoskeletal examination. This finding could reflect lack of knowledge in physical examination performance or lack of registration. In an emergency room setting, professionals could be less worried about registering on files, especially considering a not lethal complaint. That could actually be the reason why patients with musculoskeletal complaints had lower registrations of the vital signs, although that had not occurred with cardiac and respiratory examinations registrations (systems primary involved in lethal conditions).

On the other hand, all patients with skin symptoms (complaint most of the times not associated with gravity) had a skin examination described. In agreement with that, we observed a lower frequency of cardiac and respiratory examination registration on these patients. Even considering the fact that skin examination demands (most of the times) lesser effort to be performed, this finding reinforces the possibility of musculoskeletal physical examination neglect. In addition, 50 out of 56 patients who presented with abdominal pain had an abdominal physical examination described, which also reinforces our hypothesis.

There is plenty of evidence of musculoskeletal examination negligence in clinical practice. This occurs in a variety of clinical settings,[10,11] and may have a number of explanations. Lillicrap *et al.*[12] also evaluated the extent of musculoskeletal assessment (history and examination) amongst medical

in-patients. Active musculoskeletal problems were seen frequently amongst medical in-patients (63% of all the patients had locomotors symptoms) but signs were recorded in 20% of patients. They concluded that there is significant discrepancy between the number of patients with clinical symptoms and signs and the frequency with which they are detected and treated.

Teaching of musculoskeletal examination at medical schools has frequently been regarded as poor, and this has been pointed out as the most important reason for musculoskeletal medicine negligence by the health system. Musculoskeletal system examination is especially important in making a diagnosis since in several conditions diagnosis can be made without further testing, and also because of the lack of "gold standard" diagnostic tests in some other diseases.

Reports from Canada suggest that only 12% of their clinical schools have mandatory teaching in musculoskeletal disease.[3] In the United Kingdom, the majority of medical schools includes rheumatology clinical skills teaching in the curriculum for all of their students, but in some schools up to half the students may receive no clinical rheumatology teaching at all.[5] A study on the curriculum analysis of medical schools from Canada published in 2001 revealed that, on average, medical schools in Canada devoted 2.26% (range, 0.61% to 4.81%) of their curriculum time to musculoskeletal education.

Freedman and Bernstein[13] evaluated the quality of musculoskeletal knowledge among a cohort of recent medical school graduates. In that study, they administered a basic competency examination in musculoskeletal medicine to eighty-five residents on their first day of residency at their institution. The examination was validated by surveying orthopedic program directors. According to their criterion, 82% of our test group of recent medical school graduates failed to demonstrate basic competency in musculoskeletal medicine. Latter, the validation process was repeated with program directors of internal medicine residency departments. According to them, a large majority of the examinees once again failed to demonstrate basic competency in musculoskeletal medicine.[14]

A study from Harvard medical school assessed medical students' knowledge and clinical confidence in musculoskeletal medicine. A cross-sectional survey of students in all four years of Harvard Medical School was conducted during the 2005-2006 academic year. Participants were asked to fill out a 30-question survey and a nationally validated basic competency exam in musculoskeletal medicine. Medical students rated musculoskeletal education to be of major importance (3.8/5) but rated the amount of curriculum time spent on musculoskeletal medicine as poor (2.1/5). These findings, which are consistent with those from other schools, suggest that medical students do not feel adequately prepared in musculoskeletal medicine and lack both clinical confidence and cognitive mastery in the field.[15]

Our study confirms others observations worldwide. Musculoskeletal complaints are frequent in an emergency room setting and in spite of that it is suggested that musculoskeletal symptoms are poorly evaluated, which is probably related to an insufficient musculoskeletal education. Our results must be taken in the context of several limitations. First, although the lack of musculoskeletal physical examination registration suggests that it was not performed, we cannot be sure about that. Second, if the physical examination was really neglected, that could have occurred for other reasons not related to musculoskeletal medicine knowledge, especially considering that this study was performed in an emergency setting, where professionals could devote lesser time with files fulfilling (particularly when evaluating complaints not considered that urgent). However, the high frequency of physical examination registration in patients with cutaneous and abdominal complaints suggests the health unit was not an important factor to be considered and a lack of musculoskeletal medicine knowledge is more likely to be the reason. Finally, this is a single-institution study and our results may not represent those of other medical institutions, although it is likely pertinent to other medical schools.

In conclusion, the view that examination of the musculoskeletal system is of lesser importance than that of other systems is at odds with the frequency of musculoskeletal complaints in clinical practice, their place as the most common cause of disability in the community, their contribution to the burden of disease in the population and the contribution made to the diagnosis of these conditions by clinical examination.[6] It is essential that we provide teaching of high quality to the next generation of doctors who are going to require the knowledge and skills of musculoskeletal system in their working lifetimes more than ever. Medical schools should place more emphasis on these conditions so that young physicians entering their residencies will feel as well prepared to deal with such conditions as they are prepared to deal with problems found in other body systems.

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