Prevalence of Musculoskeletal Pain and Rheumatic Diseases in the Southeastern Region of Mexico. A COPCORD-Based Community Survey

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ABSTRACT. ***Objective.*** To assess the prevalence of musculoskeletal (MSK) pain and rheumatic diseases in the southeastern Mexican state of Yucatán.

Methods. Using the Community Oriented Program in the Rheumatic Diseases (COPCORD) methodology, we performed a door-to-door, cross-sectional study generated through a multistage, stratified, randomized method on 3915 adult residents (age 42.7 ± 17.1 yrs; women 61.8%; urban setting 45.7%) of the Mexican state of Yucatán. We used universally accepted criteria for the diagnosis or classification of rheumatoid arthritis (RA), osteoarthritis (OA; knee and hand), fibromyalgia, systemic lupus erythematosus (SLE), gout, ankylosing spondylitis, regional rheumatic pain syndromes, and inflammatory back pain.

Results. Nontraumatic MSK pain in the last 7 days was present in 766 (19.6%; 95% CI 18.3–20.8) individuals. MSK pain was more prevalent in women (26.6%) versus men (12.2%; $p < 0.01$). Self-reported MSK disability occurred in 1.7%. Most MSK pain-related variables were consistently more prevalent in the urban setting. The prevalence of rheumatic disease was: OA 6.8% (95% CI 6.0–7.6); back pain 3.8% (95% CI 3.2–4.4); RA 2.8% (95% CI 2.2–3.3); rheumatic regional pain syndromes 2.3% (95% CI 1.9–2.8); inflammatory back pain 0.7% (95% CI 0.5–1.0); fibromyalgia 0.2% (95% CI 0.1–0.4); gout 0.1% (95% CI 0.07–0.3); and SLE 0.07% (95% CI 0.01–0.2).

Conclusion. The prevalence of MSK pain was 19.6%. MSK pain was more prevalent in women and in the urban setting. A remarkably high prevalence of RA was found in this population, which suggests a role for geographic factors. (J Rheumatol 2010;37 Suppl 86:21–25; doi:3899/jrheum.100954)

Key Indexing Terms:
RHEUMATIC DISEASES | MEXICO | MUSCULOSKELETAL PAIN
PREVALENCE | COPCORD | EPIDEMIOLOGY

Rheumatic diseases are among the most relevant health issues worldwide owing to the human suffering they impose, in addition to their increasing social and economic costs[1,2]. For example, in the USA, the total economic cost due to rheumatic diseases in 2003 was set at $128 billion US, equivalent to 1.2% of the gross domestic product[3]. Epidemiologic studies are needed worldwide to determine the effects of rheumatic diseases and to plan public health policies specifically designed to meet the requirements of each continent, country, and region[4].

In most developed countries, epidemiological studies are less difficult to perform than in developing countries, due to their solid and highly structured healthcare systems, which make data collection and analysis easier. In contrast, knowledge of the possible effects of the rheumatic diseases in developing countries is scarce[4]. During the 1980s, an international collaborative effort produced the Community Oriented Program for the Rheumatic Diseases (COPCORD) methodology, which initially afforded a reproducible and accessible instrument for performing community-based studies to determine the prevalence of musculoskeletal (MSK) complaints and rheumatic diseases in developing countries[5,6,7]. As a result, since 1985, at least 22 COPCORD-based community surveys with cross-cultural adaptations of the instrument

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have been carried out within 14 developing countries[8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29]. A noteworthy finding when comparing these studies is the wide variation in the prevalence of MSK complaints and rheumatic diseases, even between different regions of the same country[30]. Since these surveys have been carried out with a similar sampling methodology and case definition, it seems that the variations in prevalence are real and could be related to the ethnic, demographic, economic, or biological differences among the populations.

Since all previous data reinforce the need for more epidemiological studies to determine the epidemiological influence of rheumatic diseases, we performed the present cross-sectional, community, stage 1 COPCORD methodology-based study to assess the prevalence of MSK pain and the most representative rheumatic diseases in the southeastern Mexican state of Yucatán, whose inhabitants have been confirmed to have a distinctive ethnic, social, economic, and demographic profile compared to other regions of Mexico[31].

MATERIALS AND METHODS

According to the 2005 Mexican National Survey of Inhabitants and Dwellings (National Institute of Statistics, Geography, and Informatics), the Yucatán state in southeastern México has 1,818,948 inhabitants and an almost balanced gender relationship (men 49.3%; women 50.7%). Less than half its inhabitants (40.2%) live in the main urban setting, the city of Merida. In this urban context, most inhabitants have a varying degree of Mestizo (Mayan-Spanish) origin; in contrast, the majority of the inhabitants of the rural sites belong almost exclusively to the Mayan ethnic group[31].

Methodology. Our survey was performed in accord with the 3 phases suggested for stage 1 COPCORD methodology[5,6,7]. The first phase was the detection of cases of MSK pain during the last 7 days in the community through application of a validated version of the COPCORD screening questionnaire for the Mexican population[21]. Afterwards, individuals with MSK pain underwent a clinical examination by a primary care physician in the community especially trained for this study. In case of diagnostic uncertainty, an examination by a board-certified rheumatologist was performed. MSK pain detection and a clinical evaluation by a primary care physician were performed the same day. When necessary, the rheumatologic evaluation was carried out a maximum of 24 hours after MSK pain case detection.

Ethics issues. The protocol was approved by the Research and Ethics Committee of the High Specialty Medical Unit of the Instituto Mexicano del Seguro Social in Merida, Yucatán, Mexico. All participants signed informed consent before entry to the study. Every individual identified as having any disease (either rheumatic or nonrheumatic) without medical care was advised to seek medical assistance and directed to the corresponding healthcare system.

The sample size for this survey was calculated based on an ad hoc pilot study, as well as considering the mean prevalence of MSK pain of previous COPCORD-based studies as a reference. Consequently, considering an uncertainty level of 3%, a confidence interval of 95% (95% CI), and power of 80%, as well as taking into account the urban/rural population relation for stratification purposes, the sample size was set at 3900 individuals.

Case definitions. American College of Rheumatology (ACR) criteria were used for diagnosing hand[32] and knee[33] osteoarthritis (OA), rheumatoid arthritis (RA)[34], fibromyalgia (FM)[35], and systemic lupus erythematosus (SLE)[36]. Additionally, we used Wallace criteria for gout diagnosis[37], modified New York criteria for ankylosing spondylitis (AS)[38], and Berlin criteria[39] for inflammatory back pain. The diagnosis of rheumatic regional pain syndromes was based on the Southampton group criteria[40]; and ad hoc expert consensus case definitions were used for trigger finger and lower limb rheumatic regional pain syndromes. Diagnosis of the remaining diseases was based on the clinical criteria of the surveying physician.

Statistical analysis. Prevalence figures with 95% CI were used for depicting the descriptive epidemiological effects of MSK pain and rheumatic diseases. When necessary, inferential analyses were performed based on unpaired t test, and chi-square with Yates correction or Fisher's exact test. Analysis was performed using the Stata statistical software. The p value was set at 0.05.

RESULTS

Sample characterization. The final sample size was 3195 individuals whose mean (standard deviation) age was 42.7 (17.1; range 18–99) years and education level 7.8 (4.5) years. There were 2422 (61.8%) women and 1493 (38.2%) men.

In all, 1787 (45.6%) were from the city of Merida; 2128 (54.4%) were surveyed in rural settings such as Akil (n = 105), Baca (n = 192), Chikindzonot (n = 258), Conkal (n = 564), Dzan (n = 245), Hocaba (n = 117), Opichen (n = 191), Sucila (n = 261), and Tahmek (n = 195).

Regarding socioeconomic status, monthly family income (US dollars) was reported as follows: 2093 individuals (56.8%) earned < $256; 1296 (35.2%) $257–512; 236 (6.4%) $513–1024; 46 (1.2%) $1025–1536; and 16 (0.4%) > $1537. Two hundred twenty-eight individuals (5.8%) declined to provide such information.

MSK pain features. Nontraumatic MSK pain in the last 7 days was reported by 766 individuals (19.6%; 95% CI 18.3–20.8); most ranked pain intensity score on a visual analog pain scale (0–10) as medium or high, i.e., > 4 (Table 1). The knee was the most affected body region, followed by hands, spine, and shoulders (Table 2). Remarkably, MSK pain was consistently more prevalent in the group of individuals older than 76 years and in women (Table 3).

Prevalence of rheumatic diseases. OA was the most prevalent rheumatic disease found in this study, followed by nonspecific low back pain, regional rheumatic pain syndromes, and RA. The most important in this regard was the high prevalence of 2.8% of RA. Prevalence of inflammatory back pain, FM, gout, AS, and other diseases was lower than 1.0% (Table 4).

Table 1. Description of musculoskeletal pain-related variables collected using the COPCORD instrument (n = 3915).

Item	n	Prevalence, %	95% CI
Previous MSK pain	842	26.3	24.8–27.8
Previous MSK disability	236	6.0	5.3–6.7
Treatment for MSK pain (any time)	830	21.2	19.9–22.4
MSK pain in the last 7 days	895	22.8	21.5–24.1
Nontraumatic MSK pain in the last 7 days	766	19.5	18.3–20.8
Nontraumatic MSK pain > 4 (VAS 1-10)	685	17.5	16.3–18.6
Concurrent MSK disability	70	1.7	1.3–2.2

MSK: musculoskeletal; VAS: visual analog scale.

Table 2. Body regions affected in the individuals with nontraumatic musculoskeletal pain (n = 3195)*.

Body Region	n	Prevalence, %
Spine (neck and low back)	219	5.6
Shoulder	193	4.9
Elbow	88	2.2
Hand	231	8.2
Upper limb†	64	1.6
Hip	66	1.7
Knee	474	12.1
Ankle	65	1.7
Foot	74	1.9
Heel	28	0.1
Lower limb†	87	2.2

* The sum is > 766 because some subjects had concurrent pain in several body regions. † Not possible to regionalize.

Table 3. Comparison of the prevalence of nontraumatic musculoskeletal pain between men and women (n = 3915). Values are number (%).

Age, yrs	Men, n = 1493	Women, n = 2422	p
Overall	183 (12.2)	583 (26.0)	< 0.01
18–25	9/320 (2.8)	51/436 (11.7)	< 0.01
26–35	19/313 (6.0)	81/563 (14.3)	< 0.01
36–45	21/257 (8.1)	112/479 (23.3)	< 0.01
46–55	33/191 (17.2)	116/360 (32.2)	< 0.01
56–65	39/199 (19.6)	107/288 (37.1)	< 0.01
66–75	33/120 (27.5)	83/201 (41.2)	0.01
> 75	29/93 (31.1)	33/95 (34.7)	0.60

Table 4. Prevalence of the rheumatic diseases detected (n = 3915).

Diagnosis	n	Prevalence, %	95% CI
Osteoarthritis	267	6.8	6.0–7.6
Nonspecific back pain	148	3.8	3.2–4.4
Rheumatoid arthritis	110	2.8	2.2–3.3
Rheumatic regional pain syndromes	92	2.3	1.9–2.8
Inflammatory back pain	30	0.7	0.5–1.0
Fibromyalgia	10	0.2	0.1–0.4
Gout	7	0.1	0.07–0.3
Systemic lupus erythematosus	3	0.07	0.01–0.2
Rheumatic fever	2	0.05	0.01–0.1
Ankylosing spondylitis	1	0.02	—
Psoriatic arthritis	1	0.02	—
Osteochondritis	1	0.02	—

Comparison between urban and rural settings. The comparison of rural and urban data produced some significant differences (Table 5). The influence of MSK pain in the urban setting was greater than in rural sites.

DISCUSSION

Our study was performed in accord with the stage 1 COPCORD methodology and included a multistage, stratified, randomized sample of 3915 individuals from the southeastern Mexican state of Yucatán. We found a 19.6% prevalence of MSK pain, which was higher in women and in the urban setting.

The prevalence of MSK pain has been consistently approached as a primary outcome in all the community COPCORD-based studies. Remarkably, the comparison of COPCORD results from many countries shows high variability in prevalence of MSK pain, ranging from 13.3% in Shanghai, China[20], to 66.0% in rural Iran[8]. In most studies, the prevalence of MSK pain ranges between these extremes[9,10,12,13,14,15,16,17,21,22,23,24,25,26,27,28,29]. Until now, there is no clear explanation for this variability in MSK pain in the community. Unfortunately, analysis of demographic, ethnic, and socioeconomic factors in such populations has not been applied consistently.

Where prevalence of MSK pain in urban versus rural populations has been reported, contrasting data have emerged. Joshi and Chopra[11] and Haq, *et al*[15] reported higher prevalence of MSK pain in rural versus urban populations; conversely, Darmawan, *et al*[27], and our study found the opposite. Our findings are supported by the fact that MSK pain-related disability and pain intensity were more prevalent in urban settings.

Comparable to the 2 other COPCORD-based studies in which this issue has been addressed, our study found a consistently higher prevalence of MSK pain in women[17,29].

In accord with most community COPCORD-based studies, we also found a decreasing gradient of prevalence for the studied diseases, OA, low back pain, RA, and soft tissue rheumatism, the 4 most prevalent rheumatic disorders. The prevalence of FM, SLE, gout, AS, and other miscellaneous rheumatic diseases could also be ranked within the range of the frequencies reported in all other COPCORD studies[7,8,9,10,11,12,13,14,15,16,17,18,19,20,22,23,24,25,26,27,28,29], including the study by Cardiel and Rojas-Serrano[21], performed in the central region of México.

A remarkable finding was the relatively high prevalence of RA in our sample: 2.8%. The only comparable results, reported by Reyes-Llerena, *et al*, in a small study of 300 urban residents of La Havana, Cuba, was 2.7%[24]. Our results place the population of the Yucatán at the top of RA prevalence among all the community COPCORD-based studies, including the previous Mexican report by Cardiel and Rojas-Serrano, where the prevalence was set at 0.3%[21].

Although RA prevalence may be overestimated in community-based surveys, we believe we avoided this flaw due to our sampling method, the type of screening for MSK pain, and the use of ACR criteria for case definitions: thus this relatively high prevalence of RA is a real possibility. Moreover, findings that Yucatán may be epidemiologically characterized by a relatively high prevalence of RA are supported by the report of Alvarez-Nemegyei, *et al*, in which all the 761 adult residents of a small rural village of Yucatán were included. In that study, a prevalence of 4.7% was

Table 5. Variables that were statistically different between urban and rural settings (n = 3915). Values are number (%).

Item	Rural, n = 2128	Urban, n = 1787	p
Women	1253 (58.9)	1169 (65.4)	< 0.01
Have a rumunerated job	1621 (76.1)	1269 (71.0)	< 0.01
Concurrent MSK pain	406 (19.0)	489 (27.3)	< 0.01
Concurrent nontraumatic MSK pain	348 (16.3)	418 (23.3)	< 0.01
MSK pain ≥ 4 (VAS 0–10)	315 (14.8)	370 (20.7)	< 0.01
Previous MSK pain	358 (16.8)	484 (27.0)	< 0.01
MSK disability			0.01
Never	430 (79.1)	504 (72.1)	
Sometime	89 (16.3)	147 (21.0)	
Current	24 (4.4)	46 (6.6)	
Treatment for MSK pain	355 (16.6)	475 (26.5)	< 0.01
Coping with MSK pain			< 0.01
Very well	56 (10.0)	73 (10.5)	
Well	381 (71.4)	454 (63.6)	
Fair	88 (16.5)	175 (24.5)	
Not at all	8 (1.5)	11 (1.5)	
Unspecific back pain	96 (4.5)	52 (2.9)	0.01

MSK: musculoskeletal; VAS: visual analog scale.

found; however, their study was not COPCORD screened, nor were ACR criteria for RA used for diagnosis[41].

The unexpected female overrepresentation, despite the planned sampling strategy aimed to avoid such issues, can be argued to be a major potential drawback of our study. The fact that almost all rheumatic diseases have a female preponderance could have resulted in the overestimation in prevalence of at least some diseases such as RA, SLE, and FM. We retrospectively think that, currently, this overrepresentation cannot be avoided in community surveys carried out in the geographic region studied because the prevailing socioeconomic changes in this setting may have resulted in the migration of males to other geographic sites (inside or outside México) in search of employment to support their families.

We conclude that the prevalence of MSK pain in the southeastern Mexican state of Yucatán was 19.6%; MSK pain was more frequent in females, in addition to being more prevalent and having more functional repercussions in the urban setting. Further, when compared to all the previous community COPCORD-based reports, this population seems to have a relatively higher prevalence of RA. This finding warrants more basic and/or epidemiologic research to verify whether in this population this finding is real and if so, to identify the single or intervening ethnic, social, demographic, environmental, or biologic factors.

Our findings highlight the necessity of initiating phase 2 COPCORD methodology (interventions in patient education and treatment) in the geographic region studied.

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