Family Practice Vol. 21, No. 4 © Oxford University Press 2004, all rights reserved. Printed in Great Britain
Doi: 10.1093/fampra/cmh411, available online at www.fampra.oupjournals.org

The clinical and economic burden of fibromyalgia compared with diabetes mellitus and hypertension among Bedouin women in the Negev

Yariv Doron[a], Roni Peleg[a,b], Aya Peleg[c], Lily Neumann[c] and Dan Buskila[d]

Doron Y, Peleg R, Peleg A, Neumann L and Buskila D. The clinical and economic burden of fibromyalgia compared with diabetes mellitus and hypertension among Bedouin women in the Negev. *Family Practice* 2004; **21:** 415–419.

Background. Fibromyalgia (FM) is a common idiopathic chronic, widespread pain syndrome with tenderness in anatomically defined tender points.

Objectives. The purpose of the present study was to describe and characterize the economic and daily work burden of FM compared with diabetes mellitus and hypertension.

Methods. A retrospective study was conducted in 2001 in a primary care clinic, the Kuseife clinic of the Clalit Health Services. Data for the three study groups were obtained from the computerized database of the Kuseife clinic and the Negev District, Israel. The study group included 102 FM patients. The control groups included 102 diabetes patients and 103 patients with hypertension.

Results. Hospitalization and hospital day care services were the main expenses incurred by patients in this study. There were no differences among the study groups in any cost parameter examined except for the cost of diagnostic tests ($P < 0.01$), which was less for FM patients. FM patients were referred to specialists and diagnostic procedures more frequently than the control groups. No statistical difference was found in the total number of clinic visits, but FM patients visited physicians more frequently and visited nurses less frequently than patients in the other two groups ($P < 0.05$).

Conclusions. FM patients consume health care resources to a similar extent to patients with other chronic diseases such as diabetes mellitus and hypertension, but the latter usually receive much more attention from the health care system. Greater awareness of this disorder can improve management and facilitate planning of health care resources, thus improving quality of care.

Keywords. Bedouins, cost, diabetes mellitus, fibromyalgia, hypertension, medical resources.

Introduction

Fibromyalgia (FM) is a chronic disorder of diffuse aching pain, or stiffness in the muscles or joints, accompanied by tenderness on examination at specific, predictable anatomic sites known as tender points (TPs).[1–3] The prevalence of FM in the general population has been estimated at 2%, with >90% of the patients female.[4,5] A constellation of ancillary symptoms may be present, including headache, fatigue, sleep disturbances, paraesthesias, irritable bowel syndrome, subjective joint swelling and other manifestations.[1] The currently accepted diagnostic criteria for FM are the 1990 American College of Rheumatology (ACR) criteria[6] that include the presence of widespread pain in combination with tenderness of 11 or more of 18 specific TPs. Despite intensive research, major gaps in the understanding of the pathogenesis of FM remain. Physician awareness of FM is relatively low despite the prevalence of the syndrome. Thus, it is not uncommon to see patients who have gone from doctor to doctor and

Received 4 April 2003; Revised 15 October 2003; Accepted 10 March 2004.
[a]Department of Family Medicine, [c]Department of Epidemiology and Health Care Services Evaluation, Faculty of the Health Sciences, [d]Rheumatology Unit, Soroka Medical Center and Faculty of the Health Sciences, Ben-Gurion University of the Negev, Beer-Sheva and [b]Kuseife Clinic, Clalit Health Services, Southern District, Israel. Correspondence to Roni Peleg, MD, Department of Family Medicine, Ben-Gurion University of the Negev, PO Box 653, Beer-Sheva, Israel 84105; E-mail: pelegr@bgumail.bgu.ac.il

who underwent multiple diagnostic tests, with a differential diagnosis that includes lupus erythematosus, rheumatoid arthritis, somatization and malingering.[7]

FM can be found in all ethnic groups, especially low socio-economic groups. It is prevalent in all countries, unrelated to the level of industrialization and local culture. In primary rheumatology clinics, referrals for FM comprise 14–20% of new visits,[5] making FM the second to third most common reason for appointments. A study in the USA[4] showed that FM patients make 10 primary care appointments per year and are hospitalized on average once every 3 years (primarily for indications related to FM). The mean annual cost per patient in 1996 was US$2274. The cost of management of FM in primary care clinics is high because of the work-up and treatment, although the treatment outcomes are usually disappointing.[4]

To date, there have been no reports of the characteristics of FM among Bedouin women in the Negev region of southern Israel. The Bedouins make up 11.9% of the Negev population[8] and are considered a low socio-economic group. As a group, they suffer from under-diagnosis of disease, and data on prevalence and incidence of diseases are scant. There are no data on the prevalence of FM in this population or its cost in terms of health care resources.

In a study of family physicians in the Negev area, there was evidence of low awareness of the diagnostic criteria for FM leading to under-diagnosis and under-treatment of the disorder.[9] Since FM is a common disorder, under-diagnosis causes excessive testing and inappropriate treatment. The delay in diagnosis causes an economic burden on the health care system and frustration for patients and their families.

In the present study, we assessed the economic resources consumed by female FM patients and the daily work burden involved in their care, in comparison with other chronic diseases such as diabetes mellitus and hypertension, in the setting of a primary care clinic in the Bedouin community in the Negev.

Methods

Clinical setting

Israel has had a compulsory national health insurance system since 1995 in which the entire population receives health care through non-profit health maintenance organizations known as health services or sick funds. The Clalit (General) Health Services serves ~60% of Israel's population.

The study was conducted at the Kuseife clinic of the Clalit Health Services in the southern district of Israel. The clinic provides services for 8600 registered patients, ~50% comprised of residents of Kuseife village and the rest from the surrounding settlements. The clinic population is of low socio-economic status. Many live in small stone houses, wooden or tin huts, or even tents. Many are supported by welfare and social security. Most have a limited formal education and many of those over the age of 40 have no formal education at all. The clinic population has an annual rate of natural increase of 5.3%, among the highest in the world. This is a homogeneous population of women who live together in a well-defined and densely populated living area in an expanded family structure with second-degree and further removed intra-family marriage ties.

The Kuseife clinic has three paediatric and three adult medical units. Adolescents from the age of 17 are treated in the adult clinic. All clinic visits and laboratory and ancillary test results are kept in the clinic's computerized database.

Subjects

The study population consisted of 102 women above the age of 17 years with FM. These patients were identified and diagnosed as part of a larger trial conducted at the same time. All subjects fulfilled the diagnostic criteria of the ACR for FM.[6] All the participants completed a quality of life questionnaire in the clinic, underwent a full medical examination and were followed by a clinic doctor.

There were two control groups, each with the same number of participants. The first was comprised of patients with diabetes mellitus, and the second of patients with hypertension. Both groups included Bedouin women over the age of 17 who were seen in the Kuseife clinic. Patients in the two groups were followed in the clinic.

Demographic data were collected in the larger study. The two control groups were selected randomly from the patient register of the clinic, using the database software 'Clicks' in use throughout the Clalit Health Services. Only one woman with FM was included in the hypertension groups and four women with FM were included in the diabetes group. The control groups were comprised of patients with hypertension without diabetes or diabetes without hypertension, so there was no overlap between the groups.

Health care utilization

The number of clinic visits by the study participants over the course of 2001 was determined from the clinic database. The number of appointments with the nurse was obtained from the nurse diaries, which record visits for blood pressure measurements, glucose testing and for prescriptions for chronic medications.

The cost of treatment to the Clalit Health Services was determined on the basis of five items: (i) the cost of hospitalization; (ii) the cost of ambulatory day care in the hospital; (iii) the cost of consultations in the hospital and in specialist clinics; (iv) the cost of diagnostic tests such as computed tomography (CT), magnetic

resonance imaging (MRI) and laboratory tests; and (v) the cost of visits to the emergency room.

These data were collected from the existing database of the economic unit of Clalit Health Services, southern district. A detailed computer output was obtained for each participating patient for each of these five items. The cost of health care in the public sector in Israel is: hospitalization US$333/day, in-hospital ambulatory day care US$184/day, emergency room visit US$104, medicine consultation in the out-patient department US$38, MRI US$469, abdominal CT US$252, and abdominal sonogram US$93.

Demographic data including age, gender and clinic affiliation were verified by cross-matching the clinic data with the central database of the Clalit Health Services to avoid mistakes in the study and control groups.

The study data were organized with Excel software and were transferred to Stata software for statistical analyses.[10] Multivariate analyses were done by analysis of variance (ANOVA). Since there was a significant difference in age between the study group and the control groups, the analysis of covariance (ANCOVA) test was used to control for this variable. Since the distribution of the variables related to cost were not normally distributed, a non-parametric test, Kruskal–Wallis, was used to compare costs across the three groups. Statistical significance was set at $P < 0.05$.

The Helsinki Committee of the Soroka Medical Center in Beer-Sheva, Israel approved the study.

TABLE 1 *Mean annual cost, per patient, for health services, by study group (US$[a])*

	Fibromyalgia	Diabetes mellitus	Hypertension	P[b]
Hospitalization	926.80	1244.70	918.50	0.3
Hospital day care	532.80	839.70	1497.70	0.2
Specialist consultations	35.70	32.90	39.00	0.3
Diagnostic tests	26.20	42.40	33.20	0.006
Emergency room visits	121.50	159.50	110.10	0.86

[a] US$1 = 4.3 NIS (New Israeli Shekels).
[b] Kruskal–Wallis test.

Results

There were 102 patients in the FM and diabetes groups and 103 patients in the hypertension group. The mean ages (±SD) were 44.5 ± 13.8, 56.9 ± 11.5 and 56.0 ± 14.3, respectively. Table 1 presents the mean annual costs associated with each of the groups. The major cost items for all groups were hospitalization and hospital day care. The other three items had relatively lower costs. The only item in which there was a statistically significant difference between the FM group and the control groups was for diagnostic testing, in which the FM group cost significantly less ($P < 0.01$).

Figure 1 presents a comparison of clinic and emergency room visits, tests, consultations and hospitalizations for the three groups. FM patients are referred more to specialists and undergo more tests than the other two groups.

Table 2 presents data on clinic visits in general and doctor and nurse appointments specifically. After controlling for age, no difference was found in the absolute number of clinic visits among the groups. However, FM patients made significantly more appointments with doctors ($P < 0.05$), while diabetes and hypertension patients made significantly more visits with nurses ($P < 0.05$).

Discussion

FM is a common disorder with a monthly incidence that has been shown to reach 9–10% in the general population.[11,12] Clinical studies of FM patients indicate that it is a complex medical condition with chronic symptoms that is often refractory to treatment.[13,14] Although FM is a common disorder, data on its daily work burden and economic cost in primary practice are scarce.

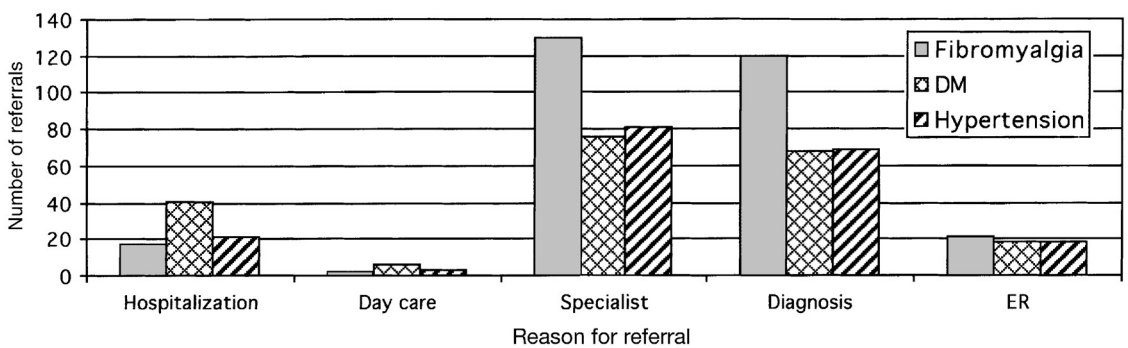

FIGURE 1 *Reasons for referrals for health care services, by study group*

TABLE 2 *Mean annual number of clinic visits, by study group*

	Fibromyalgia	Diabetes mellitus	Hypertension	*P*[a]
Total visits	17.8	18.5	16.5	0.33
Doctor visits	15.6	11.7	10.4	<0.05
Nurse visits	2.2	6.8	6.1	<0.05

[a] ANCOVA.

In the present study, we addressed the use of health care resources in a group of FM patients in a primary care clinic that serves the Bedouin population in southern Israel. In order to better understand this use of health care resources, we compared this patient group with patients with two other chronic illnesses, i.e. diabetes mellitus and hypertension. We found that the major economic cost to the system in all three groups was hospitalization. There were no statistically significant differences among the groups in hospitalization costs (full hospitalization or day care). Thus, FM patients present the same economic burden as diabetes mellitus and hypertension. Although FM patients are referred more often for specialist consultations and undergo more diagnostic tests, there were no significant differences in overall costs among the groups. This may be due to the fact that these services are basic and less expensive than hospital costs.

The results of the study also indicate that FM patients had a similar number of clinic visits to patients in the other two groups. However, the nature of those visits is significantly different. The diabetes and hypertension patients visit nurses more often for monitoring and treatment of their diseases, while FM patients see doctors more frequently. This is due to the fact that follow-up and treatment of FM patients requires attention to a myriad of complaints that require the doctor's time. This finding is consistent with our other finding that FM patients are referred for a significantly greater number of specialist consultations than the other two groups.

We conclude from the results of this study that FM is a considerable burden on the primary care system and necessitates the use of significant health care resources. Even though the group of women with FM is younger, the extent of health care use is similar to that of common chronic diseases such as diabetes mellitus and hypertension, of which primary care doctors are much more aware. Only health care costs were considered. The economic consequences of these conditions go beyond the health service and include social costs such as informal care costs and production costs.

A study of 172 family physicians in the Negev region of Israel[9] demonstrated that physicians are not familiar with the diagnostic criteria for FM, although 96% thought that they were. They were able to identify most of the symptoms of the disorder, but were not able to establish the diagnosis. Only 55% knew that the syndrome is characterized by diffuse pain, and even fewer (25%) could name the characteristic TPs. The study also showed that continuing education improved awareness and knowledge of the disorder. The conclusions of that study together with the conclusions of the present study indicate that there is a need for a change in approach to FM. This is a disorder of similar clinical and economic importance to chronic diseases that receive much more attention from the health care system. Greater awareness of the disorder and knowledge of its characteristics, including its economic burden, can improve management and facilitate planning of health care resource, thus improving quality of care.

This study was conducted in a single clinic in the Bedouin sector. We cannot automatically generalize the findings to Jewish clinics. Other comparative studies should be conducted on different and larger populations to characterize the burden of this disorder further. The results of such a comprehensive research effort should be of value to both the clinical and administrative staffs of the health care services.

Acknowledgements

This study was carried out in partial fulfilment of the requirements for an MD degree (YD) at the Faculty of the Health Sciences, Ben-Gurion University of the Negev, Beer-Sheva, Israel.

References

1 Bennett RM, Smythe HA, Wolfe F. Recognizing fibromyalgia. *Patient Care* 1989; **23:** 60–83.
2 McCain GA. Fibromyositis. *Mod Med Can* 1983; **38:** 197–207.
3 Smythe HA. Fibrositis as a disorder of pain modulation. *Clin Rheum Dis* 1979; **5:** 823–832.
4 Wolfe F, Anderson J, Harkness D *et al*. A prospective, longitudinal, multicenter study of service utilization and costs in fibromyalgia. *Arthritis Rheum* 1997; **40:** 1560–1570.
5 White KP, Speechley M, Harth M, Ostbye T. Fibromyalgia in rheumatology practice: a survey of Canadian rheumatologists. *J Rheumatol* 1995; **22:** 722–726.
6 Wolfe F, Smythe HA, Yunus MB *et al*. The American College of Rheumatology 1990 Criteria for the Classification of Fibromyalgia. Report of the Multicenter Criteria Committee. *Arthritis Rheum* 1990; **33:** 160–172.
7 Bennett RM. Fibromyalgia. In: Wall PD, Melzack R, eds. *Textbook of Pain*, 4th edn. Edinburgh: Churchill-Livingstone; 1999: 579–601.
8 Central Bureau of Statistics. *Statistical Abstract of Israel 1999–2000*. Jerusalem, Israel: Central Bureau of Statistics; 2001.
9 Buskila D, Neumann L, Sibirski D, Shvartzman P. Awareness of diagnostic and clinical features of fibromyalgia among family physicians. *Fam Pract* 1997; **14:** 238–241.
10 Stata Corp. *Stata Statistical Software, Release 5.0*. College Station (TX): Stata Corp.; 1997.

[11] Wolfe F, Ross K, Anderson J, Russell IJ, Hebert L. The prevalence and characteristics of fibromyalgia in the general population. *Arthritis Rheum* 1995; **38:** 19–28.

[12] Croft P, Rigby AS, Boswell R, Schollum J, Silman A. The prevalence of chronic widespread pain in the general population. *J Rheumatol* 1993; **20:** 710–713.

[13] Hawley DJ, Wolfe F, Cathey MA. Pain, functional disability, and psychological status: a 12-month study of severity in fibromyalgia. *J Rheumatol* 1988; **15:** 1551–1556.

[14] McBeth J, Macfarlane GJ, Hunt IM, Silman AJ. Risk factors for persistent chronic widespread pain: a community-based study. *Rheumatology (Oxford)* 2001; **40:** 95–101.