

# Previous Pain Experience in Women with Fibromyalgia and Inflammatory Arthritis and Nonpainful Controls

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**ABSTRACT. Objective.** To examine the frequency of commonly occurring pain and adverse experiences throughout life by self-report in women with fibromyalgia (FM) and chronic inflammatory arthritis (IA) and nonpainful healthy women.

**Methods.** Fifty-one patients with FM and 44 with IA and 52 nonpainful healthy controls were consecutively interviewed in a tertiary clinic setting regarding the occurrence of lifetime common pain experience and adverse events, as well as a family history of FM and/or a childhood pain environment.

**Results.** Patients with FM reported significantly more irritable bowel syndrome, migraine headaches, severe menstrual pain, physical and psychological trauma affecting well being, family history of FM, and family pain environment than subjects with IA or controls. Both patient groups had more adult hospitalizations and surgeries than the controls.

**Conclusion.** Patients with FM report a high rate of varied pain and adverse experiences throughout life. This real or perceived experience of pain supports the concept that FM is a lifetime disorder of pain processing. (J Rheumatol 2001;28:1888–91)

## Key Indexing Terms:

FIBROMYALGIA      INFLAMMATORY ARTHRITIS      PAIN      ADVERSE EVENTS

Fibromyalgia syndrome (FM) is a painful musculoskeletal syndrome seen most commonly in women, and as yet has no clearly defined pathogenesis. The pain of FM is ill defined, diffuse, and located mostly at musculotendinous sites. The reasons for both the onset and the persistence of this pain syndrome are speculative, and include dysfunction of central pain processing mechanisms, neuroendocrine disturbances, and psychosomatic mechanisms<sup>1</sup>.

A composite evaluation of preceding lifetime pain experience in FM has never been documented. Whether the total experience of previous pain, in particular common and recurrent pain such as growing pains, abdominal pain, dysmenorrhea, and chronic headaches, has influence on the expression of current symptoms in FM is unknown. There is, however, accumulating evidence that adult patients with FM have had more adverse lifetime experiences than controls. This includes a report of more abuse, both physical

and sexual, than other patients<sup>2,3</sup>. A recent population based study has reported more adverse childhood experiences in psychologically disturbed adults with FM than in controls, but there was no report of previous pain experience<sup>4</sup>. Patients with FM exhibit high levels of current and lifetime psychological distress, which is known to influence pain report<sup>5,6</sup>. However, there is debate whether the psychological disturbances in FM are simply manifestations of frustration and continued unrelenting pain in a chronic disease or are specific to the pathophysiology of FM. There is evidence that, especially in childhood, adverse events such as severe childhood illness, hospitalizations, and surgical interventions may be associated with psychological distress and somatic pain in adult life<sup>4</sup>. Having lived in an environment of pain and suffering may also influence an individual's response to illness and pain.

We believe that preceding pain experience both in childhood and adult life may influence the neurophysiological response to pain and may be a factor in perpetuating symptoms of FM. To test our hypothesis that patients with FM would have more previous pain experiences than other rheumatology patients or controls, we interviewed 3 groups of subjects about their lifetime pain experiences — patients with FM, patients with inflammatory arthritis (IA), and healthy controls without chronic pain.

## MATERIALS AND METHODS

Fifty-one women with a diagnosis of FM fulfilling American College of Rheumatology (ACR) criteria<sup>7</sup>, 44 women with IA [30 rheumatoid arthritis (RA; definite or classic RA), 10 seronegative polyarthritis, 2 inflammatory spondyloarthritis, and 2 polymyalgia rheumatica], and 52 controls (women without musculoskeletal complaints) were interviewed. Both groups of

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patients were consecutively attending a university affiliated tertiary care rheumatology clinic and had experienced musculoskeletal pain for at least 6 months. The control group comprised consecutive persons, who denied any current musculoskeletal or other pain, accompanying patients to the rheumatology clinic or the pain clinic. Demographic information included age and total number of years of education. Patients with FM reported the duration of symptoms of FM. Functional status in the FM group was assessed using the Fibromyalgia Impact Questionnaire (FIQ), a validated instrument in this condition<sup>8</sup>. Current pain experience for the FM group during the past week was recorded by the pain component of the FIQ. This is recorded on a 10 cm visual analog scale (VAS) with the anchors “no pain” and “very severe pain.” Similarly, current pain experience for the IA control group during the past week was recorded on a VAS that was identical to that used in the FIQ for the patients with FM. The nonpatient control group denied any musculoskeletal or other pain during the past 3 months or as a chronic symptom.

Previous pain experience was recorded as either a positive or a negative response for the following: childhood and adolescent growing pains, identified as limb pain that was recurrent and awakened the individual at night; irritable bowel syndrome (diagnosed by a physician); migraine headaches (diagnosed by a physician); dysmenorrhea of severe intensity in teenage years that was recurrent and caused the individual to lose time from school; and dysmenorrhea of severe intensity in adult life that was recurrent and caused the individual to lose time from work or interfered with usual daily functioning. A history of the numbers of hospitalizations and surgical procedures in childhood (up to age 16 years) and in adult life was recorded by patient report. A history of a traumatic event, either physical or psychological, that was perceived by the individual to have major impact upon subsequent overall well being was noted as either a positive or a negative response. The nature of the traumatic event was not recorded. A family history of FM, diagnosed by a physician, in a first-degree relative was recorded as either present or absent. A pain environment during childhood was documented as present if the individual reported that some other person living in the same household experienced prolonged pain. The test-retest reliability of the interview responses was assessed in 10 individuals on the following day and showed excellent reliability.

The study was approved by the hospital ethics committee.

For statistical analyses continuous data were analyzed by one-way analysis of variance and dichotomous data by chi-square. The VAS scores of the 2 patient groups were compared by t test. To control for possible alpha inflation due to multiple comparison testing a Bonferroni adjustment

was made ( $p = 0.05/13$  tests,  $p = 0.004$ ). Continuous variables are presented as means with standard deviation (SD).

## RESULTS

The mean (SD) age of patients in the FM, IA, and control groups was 48.8 (9.3), 52.2 (10.9), and 48.0 (12.2) years, respectively. The mean (SD) number of years of education in the control group [14.5 (3.1) yrs] was higher than the FM [13 (3.0) yrs] and IA [13 (2.8) yrs] groups ( $p < 0.05$ ). Patients with FM had a mean (SD) disease duration of 12.5 (10.6) years and a mean (SD) FIQ score of 56.2 (22). The mean (SD) VAS pain score was significantly higher in the FM compared to the IA group, 61.9 (26.2) vs 31.6 (29.3) ( $p > 0.0001$ ).

The patients with FM had significantly more recalls of irritable bowel syndrome, migraine headaches, severe menstrual pain in adult life, and physical traumatic events, as well as a greater frequency of a family history of FM and a childhood family environment of chronic pain than the patients with IA and the healthy controls (Table 1).

No differences were observed between the groups regarding the recall of growing pains or childhood surgeries and hospitalization. Both FM and IA patients reported significantly more surgical procedures as adults than the healthy subjects (Table 1).

## DISCUSSION

The effect of previous pain experience on both the presence and the perpetuation of chronic pain syndromes such as FM is poorly understood. This study was undertaken to determine whether the report of previous pain events in patients with FM differed from nonpainful and painful controls. Lifelong and repeated pain experience was a prominent finding in this group of FM patients. It is known that prior

Table 1. Pain experiences of patients with FM and inflammatory arthritis and nonpainful controls. Values are numbers of patients unless otherwise stated.

	Fibromyalgia, n = 51	Arthritis, n = 44	Control, n = 52	p**
Growing pains	18	11	12	NS
Irritable bowel syndrome	20	6	1	< 0.001
Migraines	37	19	7	< 0.001
Dysmenorrhea—teenage	26	12	16	< 0.05
Dysmenorrhea—adult	25	9	3	< 0.001
Hospitalizations—childhood*	0.84 ± 1.49	0.86 ± 1.19	0.83 ± 0.98	NS
Hospitalizations—adult*	4.7 ± 4.4 <sup>b</sup>	5.0 ± 4.0 <sup>b</sup>	2.8 ± 2.0 <sup>a</sup>	< 0.01
Surgeries—childhood*	0.73 ± 0.80	0.64 ± 0.81	0.65 ± 0.74	NS
Surgeries—adult*	3.7 ± 3.1 <sup>b</sup>	2.7 ± 3.3 <sup>b</sup>	1.4 ± 1.4 <sup>a</sup>	< 0.001
Trauma—physical	18	2	2	< 0.001
Trauma—psychological	23	12	7	< 0.01
Family history—FM	11	2	0	< 0.001
Family history—pain	17	5	2	< 0.001

\*Means ± standard deviations.

\*\*Statistically significant difference between all groups or between the groups marked “a” and “b.”

pain experience has a significant effect upon response to a specific pain event, such as pain perception during evoked pain in healthy volunteers<sup>9</sup>, or chronic postoperative pain following severe acute pain<sup>10-12</sup>. Whether prior pain affects the perception of less acute and more ill defined pain, such as that seen in FM, is unknown. Common and recurrent pain experiences that were reported with increased frequency in the patients with FM in this study included irritable bowel syndrome, migraine headaches, and severe menstrual pain, in agreement with others' findings<sup>13,14</sup>. The clustering of various pain experiences at different anatomical sites may suggest an overall lower pain threshold or dysregulation of pain processing mechanisms in both FM and other pain disorders. Menstrual pain is of particular interest because it is a regularly recurring pain event, and was reported to be of severe intensity during adolescence and adult life for 50% of the patients with FM. In addition, individual patients with FM were also more likely to report multiple sites of pain as well as more previous traumatic events, either physical or psychological, that had had major effects upon their overall well being. We did not inquire about patients' attribution of events to symptoms of FM, but note that up to 40% of FM patients relate the onset of symptoms of FM to some preceding event that might be either physically or psychologically traumatic<sup>15,16</sup>.

The importance of early pain experience and subsequent influence on pain perception in later life has only recently been appreciated. Unrelieved pain during circumcision was correlated with an increased pain response during later vaccination<sup>17</sup>. Childhood surgeries and admissions to hospital may be somatically and psychologically painful and can be seen as a surrogate for adverse experience in young life. Pilowsky, *et al*<sup>18</sup> noted an association between childhood hospitalization and adult chronic pain and depressive illness. Other adverse childhood experiences have been linked to chronic low back pain<sup>19</sup> and FM<sup>2-4,20</sup>. We did not observe any differences in the number of childhood surgeries or hospitalizations between our study groups. However, the adverse physical or psychological traumatic events reported more commonly in the patients with FM encompassed all lifetime events, occurring in both childhood and adult years.

Exposure to a family environment of chronic pain and illness may also affect the manner in which individuals respond to pain<sup>21</sup>, particularly if the exposure was in childhood. Both family history of FM and living in a pain environment as a child were more common in the FM group in this study. Familial occurrence of FM has been reported in 28% of offspring of mothers with FM, suggesting that either genetic or family environment factors may be operative<sup>22</sup>. It is possible that some individuals may have genetic predisposition to a lower pain threshold and consequently experience chronic lifetime pain, similar to their parents. Studies have explored the association of chronic pain in children

and parental pain, as well as the effect of family environment and parental response to childhood illness to subsequent adult well being. Parental response to a child's health complaints may reinforce and have lasting effect upon an individual's response to pain and pain behavior throughout life<sup>23</sup>. This has been described for irritable bowel syndrome<sup>24</sup> and menstrual illness<sup>23</sup>. Similarly, current symptoms in parents may influence somatic symptom reporting in children. More multiple chronic pain conditions were noted in parents of children with FM<sup>25</sup>, and poorer physical and emotional health was observed in the parents of children with abdominal pain<sup>26</sup>. The patients with FM in our study have reported more childhood experience of a pain environment, once again supporting the concept of the influence of childhood environment on subsequent well being.

Current pain as well as depression are known to influence the recall of the intensity of past pain. Studies have shown that patients who currently experience high levels of pain tend to overestimate the intensity of previous painful experience. In addition, emotional distress and depression affect recall of past pain<sup>27-31</sup>. One limitation of this report is that the 2 patient groups were not comparable regarding their current pain, the FM group scoring higher compared to the IA group. In addition, although the patients and controls were not overtly clinically depressed, depression was not formally assessed. Elevated depression in an individual may have introduced recall bias regarding more self-reports of previous pain experience. We examined subjects' recall of painful events rather than the recall of pain intensity, other than for menstrual pain, which was required to be severe, which may be differently memorized from ratings of pain intensity. When autobiographical memories of pain events were examined, no differences were found between patients with chronic pain and healthy controls regarding the recall of pain memories<sup>32</sup>. Thus mechanisms for recalling painful events may be different from the recall of pain ratings. Smith and Safer<sup>33</sup> observed no difference in the recall of experimentally manipulated pain in patients with and without chronic pain, suggesting that there should be no a priori reason why pain patients should be less accurate than others in recalling previous pain experience. The reliance on both the recall and self-report of preceding events may result in inaccuracies and remains a problem for all studies, including the present study, that rely on patient self-report. We acknowledge that pain report is a subjective measurement, but believe that patient perception of pain is an important but poorly understood component of FM. Finally, we observed that our question format was simple and easy to understand, and was reliable on testing.

In light of these observations, further work is needed to explore the reasons for the association observed between preceding pain and FM. It is possible that patients with FM may have a lifetime disorder of pain perception that influences all lifetime pain experience. Genetic predisposition as

a result of a reduced pain threshold may be a factor in the development of chronic pain observed at different anatomical sites. Psychological mechanisms and learned pain experience extending back to childhood may also be operative factors. This seems tenable in the context of the current hypothesis that FM is a manifestation of disordered central pain processing mechanisms. Whether commonly experienced and generally less traumatizing pain experiences are simply an association with FM or whether prior pain experience affects the expression of musculoskeletal pain in FM remains to be clarified.

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