Neck Injury and Fibromyalgia — Are They Really Associated?

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ABSTRACT. ***Objective.*** To investigate whether whiplash injury may be a trigger for the onset of fibromyalgia (FM).
Methods. One hundred fifty-three patients presenting to the emergency room with the diagnosis of whiplash injury were examined. The control group included 53 patients hospitalized with fractures of the limbs, spine, and ribs due to road accident. The study and control groups were interviewed shortly after presenting and then followed prospectively. Patients complaining of musculoskeletal symptoms during followup were examined and a count of 18 tender points was conducted. FM was diagnosed if the patient fulfilled currently accepted 1990 American College of Rheumatology criteria.
Results. The mean followup period for the study and control groups was 14.5 months (range 12-18) and 9 months (range 6–14), respectively. There were no differences between the groups with regard to age, sex, marital, education, or employment status. During the followup period only one patient in the study group and no patients in the control group developed signs and symptoms of FM. Three patients in the study group (2%) and 15 patients in the control group (16%) filed insurance claims; none was associated with FM.
Conclusion. Whiplash injury and road accident trauma were not associated with an increased rate of FM after more than 14.5 months of followup. (First Release May 1 2006; J Rheumatol 2006;33:1183–5)

Key Indexing Terms:
FIBROMYALGIA WHIPLASH INJURY TRAUMA

Fibromyalgia syndrome (FM) is a chronic musculoskeletal condition with a prevalence of 2-4% that occurs mainly in women[1]. This disorder is characterized by widespread nonarticular pains, generalized tender points, and no evidence of inflammatory abnormalities. It is usually accompanied by fatigue, sleep disturbances, headaches, gastrointestinal symptoms, and behavioral changes[2]. The etiology and pathophysiology of this disorder remain unclear, although many triggering factors such as stressful conditions[3], hormonal changes[4], disturbances in non-rapid eye movement sleep[5], and infectious agents[6] have been suggested and studied. Another etiological factor recently proposed as a trigger for the onset of FM is physical trauma. The role of physical trauma as a risk factor preceding other rheumatological conditions such as rheumatoid arthritis[7], psoriatic arthritis[8], and ankylosing spondylitis[9] remains debatable. However, in FM it seems that this association has a more solid basis. Although most studies are retrospective, they have shown that 25 to 50% of patients with FM recall a physical trauma immediately preceding the onset of their FM symptoms[10-12]. The only prospective study of a causative link between trauma and FM is that of Buskila, *et al*[13] who found a 10-fold risk of developing FM in adults with neck injury compared with patients having lower extremity fractures. The absence of similar studies and the increasing medico-legal issues and ramifications of this problem prompted us to test this hypothesis.

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MATERIALS AND METHODS

Patients. One hundred and fifty-nine patients discharged from the Emergency Room at Asaf-Harofe Medical Center between August 2003 and January 2004 with the diagnosis of whiplash injury were recruited for the study. One hundred and fifty-three patients (96%) agreed and served as the study group. Patients were informed that the primary objective of the study was to determine musculoskeletal problems following their accident. All patients were involved in car accidents and were diagnosed with whiplash injury without evidence of fractures, dislocations, or spinal subluxations on cervical radiographic studies. None of these patients had a head injury or brain concussion.

The control group comprised 53 patients hospitalized in the orthopedic, surgery, and neurosurgery wards of the hospital during this period because of severe trauma following a car accident. Of these 48 (91%) agreed to participate in the study.

Methods. All patients gave informed consent and were interviewed and followed by the same observer who was not blinded to the type of injury. A detailed questionnaire containing demographic as well as socioeconomic and clinical data was filled out by every participant on discharge from the Emergency Room. The time elapsed from injury to study enrollment was 6.2 ± 2.7 hours (range 3.5–9.5 h). Patients were followed by telephone calls after the first week and every 5 months thereafter. The interview included questions about joint pains and tenderness as well as questions about dizziness, sleep disturbances, headaches, and concentration problems. The questionnaire also included questions about quality of life (QOL), physical functioning, employment status, and insurance claims. QOL assessment was done using the Arthritis Impact Measurement Scales (AIMS 2) validated Hebrew language form[14] and physical functioning was assessed by the brief 10-item Fibromyalgia Impact Questionnaire (FIQ} validated Hebrew language

form[15]. Patients who complained of symptoms or signs suggestive of FM were invited for further evaluation that included a complete physical examination with special emphasis on examining the specific 18 tender points needed for fulfilling accepted criteria of the American College of Rheumatology (ACR) for FM[16].

Statistical analysis. Student's t test for independent samples was used to compare quantitative variables. The chi-square test or Fisher's exact test (in small samples) was performed to compare proportions.

RESULTS

Baseline characteristics of the study and control groups are presented in Table 1. Demographic and socioeconomic characteristics were similar in both groups. The followup period for the study group was longer than that of the control group (14.5 ± 1.1 vs 9 ± 2.2 months, p = 0.035).

Six patients of those eligible to participate in the study group were not enrolled in the study: 2 refused on the advice of their lawyer, another moved to another town 2 weeks after the accident, and 3 others refused to participate for no obvious reason. In the control group 7 patients eligible for the study refused to participate or stopped followup shortly after inclusion: one patient refused due to an insurance claim that was filed in court, 2 others dropped out shortly after inclusion due to medical causes (leukemia and renal failure), and 4 patients refused to cooperate because of various irrelevant reasons. A total of 12 patients who complained of musculoskeletal symptoms were recalled for detailed physical examination.

Clinical details of the control group are presented in Table 2. Patients were hospitalized for a mean of 5.6 ± 7.2 days and most (75%) had fractures in various sites.

Prevalence of FM and various symptoms of patients as well as measures of QOL, FIQ, and litigation status at the end of the followup period are presented in Table 3. Only one patient in the study group but no patient in the control group developed symptoms and signs that fulfilled the 1990 ACR criteria for FM. Study patients had significantly more impaired QOL (p = 0.043), but no differences were noted between groups with regard to physical function. Headache was statistically more prevalent in the study group (p = 0.025), while regional pain (usually at the site of the fracture) was statistically more prominent in the control group (p = 0.001). There were no differences in other symptoms such as dizziness, sleep disturbances, fatigue, and concentration problems between the 2 groups. Employment rate was the same in both groups at the end of the study, although it decreased compared to baseline. In the study group the decrease was mainly due to national economic reasons, while in the control group the decrease was a consequence of the accident. Insurance claims were more prevalent in the control group, most of them against private insurance companies and only a minority for Social Security.

Table 1. Demographic, clinical, and socioeconomic data for the study and control groups. Values are expressed as mean ± standard deviation unless otherwise defined.

Variable	Study Group, n = 153	Control Group, n = 48	p
Age, yrs (range)	47.5 ± 10.3 (27–76)	42.5 ± 13.1 (21–83)	NS
M/F ratio	93/60	30/18	NS
Followup, mos (range)	14.5 ± 3.1 (12–18)	9 ± 2.2 (6–14)	0.015
Marital status			
Single (%)	17 (11)	6 (13)	
Married (%)	136 (89)	42 (87)	
Education, yrs (range)	12.3 ± 2.4 (8–16)	11.6 ± 3.1 (8–17)	NS
Employed (%)	107 (70)	38 (79)	NS

NS: not significant.

Table 2. Clinical data of the control group.

	Control Group, n = 48
Hospitalization days, mean ± SD (range)	5.6 ± 7.2 (3–15)
Blunt trauma with no fractures (%)	12/48 (25)
Trauma with fractures (%)	36/48 (75)
Type of fracture	
Neck and shoulder	8/36 (22)
Upper limbs	10/36 (28)
Lower limbs	7/36 (19)
Chest and ribs	2/36 (6)
Multi-trauma	9/36 (25)

Table 3. Prevalence of FM and symptoms, and measures of QOL, FIQ, and litigation status at the end of the followup in study and control groups.

	Study Group, n = 153	Control Group, n = 48	p
FM (%)	1/153 (0.6)	0/48	NS
QOL ± SD	5.2 ± 0.7	4.2 ± 1.2	0.043
FIQ ± SD	0.3 ± 0.8	0.4 ± 0.7	NS
Symptoms (%)			
Dizziness	32/153 (21)	8/48 (17)	NS
Fatigue	2/153 (1.3)	1/48 (2)	NS
Sleep disturbance	20/153 (13)	5/48 (10)	NS
Headaches	35/153 (23)	3/48 (6)	0.025
Concentration problems	10/153 (6.5)	2/48 (4)	NS
Diffuse pain	1/153 (0.6)	0/48	NS
Regional pain	3/153 (2)	25/48 (52)	0.001
Insurance claims	3/153 (2)	8/48 (16)	0.001
Employed	95/153 (52)	29/48 (60)	NS

QOL: quality of life, mean of 16 subitems (scale 0–7); FIQ: measurement of physical function (10 subitems, scale 0–3).

DISCUSSION

The issue of trauma and FM remains controversial. As rheumatologists we are frequently asked by patients and/or lawyers to clarify the clinical and medicolegal situation of physical trauma preceding chronic pain disorders. The answers to such questions are complex and problematic and must be based on solid epidemiologic and controlled prospective studies. Several studies in the past, most of them retrospective, have reported that up to 50% of patients with FM

can recall an event, most often physical trauma, that immediately preceded their symptoms[11,17-19]. An extensive review of the literature failed to yield solid conclusions concerning this issue[12]. The only prospective study that found a causative link between trauma and FM is by Buskila, *et al*[13]. In this study, which was not followed by others, the authors found that 21.6% of patients with neck injury developed FM shortly after a work accident. These data are impressive since in their control group of patients with leg fractures, the rate of FM was much lower (1.7%, p = 0.001). We could not confirm these earlier findings; after a mean followup of 14.5 months, only one out of 153 patients with whiplash injury developed FM. We believe our study is more accurate and its methodology makes our results more solid. We chose a group of patients diagnosed with whiplash injury after a car accident and followed them prospectively starting immediately after discharge from the emergency room. This is in contrast to patients chosen by Buskila, *et al* who were attending an occupational injury clinic, a fact that can bias the results, since these people were already claiming their insurance/social security and were not representative of the whole injured group. Our study group did not include patients with various occupational injuries as in the previous study, but only those diagnosed with whiplash injury following a road accident. Furthermore, our results were strengthened by the absence of FM in our controls, despite their severe injuries and hospitalization.

The cultural and socioeconomic background of our study population was not different from the group studied by Buskila, *et al* and thus could not be responsible for the differences between our 2 studies. Moreover, our control group issued more insurance claims (16%) than the study group (2%), none of which was associated with FM. Only one patient refused to cooperate on the advice of his lawyer.

In conclusion, the results of our prospective study do not support earlier observations about a link between neck trauma and FM. Because of its wide medicolegal implications, well controlled multinational studies with large cohorts of patients are needed to resolve this complex issue.

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