JOURNAL OF
MUSCULOSKELETAL
PAIN

Volume 8
Number 4
2000

CONTENTS

Fibromyalgia: Time to Consider a New Taxonomy?

Jan Dommerholt

ABSTRACT. Objectives: The purpose of this paper is to review whether the time has come to reconsider the use of the term ''fibromyalgia'' to describe this syndrome.

Findings: The term ''fibromyalgia'' suggests that fibrous and muscular abnormalities are causally involved in the etiology of the syndrome or that muscle pain is the most relevant clinical finding, however, current research suggests that there are no significant structural or functional differences between fibromyalgia and normal muscles. Persons with fibromyalgia have altered nociception, hyperalgesia, allodynia, and hypervigilance. The hyperalgesia is present not only over fibromyalgia tender points but also in nonpainful regions. Several studies have suggested that fibromyalgia is due to hypersensitivity of the central nervous system rather than pathologically painful muscles.

Conclusions: The etiology and symptoms of fibromyalgia are not due to structural or functional changes in muscle or fibrous tissues. Hence, the term ''fibromyalgia'' does not describe the etiology of the syndrome adequately. The International MYOPAIN Society could be a conduit for a change in taxonomy from ''fibromyalgia'' to for example, ''complex widespread pain syndrome,'' or other name that adequately reflects the etiology and complexity of the syndrome that is now known as ''fibromyalgia.'' *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-342-9678. E-mail address: <getinfo@haworthpressinc.com> Website: <http://www.HaworthPress.com>]*

KEYWORDS. Fibromyalgia, taxonomy, hypersensitivity, allodynia, etiology

---

Jan Dommerholt, MPS, PT, is affiliated with Pain and Rehabilitation Medicine, International Myofascial Pain Academy, 7830 Old Georgetown Road, Suite C-15, Bethesda, MD 20814-2432 [E-mail: prmdocs@ix.netcom.com].

Submitted: November 3, 1999.
Revision accepted: January 12, 2000.

Fibromyalgia is a disorder of chronic widespread pain, accompanied by tenderness, fatigue, sleep disturbance, and psychological distress. Several other syndromes and clinical entities have been linked to fibromyalgia including headaches, irritable bowel syndrome, chronic fatigue syndrome, interstitial cystitis, depression, panic disorder, dyspareunia, endocrine dysfunction, restless leg syndrome, attention deficit hyperactivity disorder, and noncardiac chest pain (1-11). The term ''fibromyalgia'' replaced the previously used term ''fibrositis'' with the introduction of the 1990 American College of Rheumatology Criteria for the Classification of Fibromyalgia (12). The term ''fibromyalgia'' suggests that fibrous and muscular abnormalities are causally involved in the etiology of the syndrome or that muscle pain is the most relevant clinical finding. Based on current research findings, the time has come to review whether the term ''fibromyalgia'' is still appropriate. A brief review of pertinent literature will follow.

While several studies identified ''rubber bands'' in single muscle fibers, ''moth-eaten'' and ''ragged red'' fibers, a reduced content of high energy phosphates, and a higher rate of phosphodiester resonance, that were thought to be related to damage to the sarcolemma, an abnormal occurrence of elastic fibers, decreased levels of collagen cross links, an energy deficiency state, or local muscle hypoxia, others did not find any significant structural or functional differences between fibromyalgia and normal muscles (13-26). When fibromyalgia patients were matched with equally fit healthy controls, no differences were found in lactate and potassium levels, oxygen uptake and ^{31}P magnetic resonance spectroscopy, suggesting that patients with fibromyalgia do not have abnormal muscle metabolism (27-32). The abnormalities noted in earlier studies appear to be the result of muscle deconditioning and are not specific for fibromyalgia (33).

It has been established that persons with fibromyalgia have altered nociception and hypervigilance (34-37). Vecchiet and colleagues measured the sensitivity to electrical stimulation of the skin, the subcutis, and the muscle and observed that hyperalgesia in all three tissues was present not only over fibromyalgia tender points, but also in nonpainful regions (38). In another study, the pressure-induced pain sensitivity in fibromyalgia patients was more pronounced deep to the skin and not restricted to muscle tissue. The altered sensitivity was not dependent on increased skin sensibility (39,40). Gibson and colleagues demonstrated that persons with fibromyalgia exhibit a significant reduction in heat pain threshold as well, although this was not confirmed by Nørregaard and colleagues (41,42). In spite of these findings, there is no convincing evidence that the peripheral tissues in persons with fibromyalgia are abnormal (21,43). Graven-Nielsen and colleagues concluded that the hyperalgesia observed following painful stimuli of a pain-free muscle in fibromyalgia patients indicates the involvement of central hyperexcitability (44).

Because of the lack of specific peripheral and histological findings, the focus of fibromyalgia research has shifted toward investigations of the central nervous system and the endocrine system. Several studies have identified substance P levels to be up to three times higher in the cerebrospinal fluid of persons with fibromyalgia compared with healthy controls (45-47). Russell reported the findings of elevated levels of nerve growth factor in the cerebrospinal fluid of persons with fibromyalgia (48). Lower serum levels of both tryptophan and serotonin have been reported and it is likely that persons with fibromyalgia have low brain tissue levels of both serotonin and substance P, and low spinal cord levels of serotonin and high spinal cord levels of substance P (49-53). Several studies have found disturbances of the hypothalamic pituitary adrenal axis (7,54).

As the most widely accepted model for the pathogenesis of fibromyalgia suggests hypersensitivity of the central nervous system rather than pathologically painful muscles, the questions emerge whether fibromyalgia should still be considered a ''muscle pain syndrome,'' and whether the term ''fibromyalgia'' is still appropriate for the syndrome. Because persons with fibromyalgia display a generalized, decreased pain threshold, Russell suggested that fibromyalgia can be considered ''chronic widespread allodynia,'' as it meets the criteria for allodynia as defined by the International Association for the Study of Pain (55,56). Allodynia is defined as ''a painful response to a normally nonpainful stimulus'' (55). This modified descriptor of fibromyalgia does not consider the multiple other features of the diagnosis, including hypervigilance, hyperalgesia, psycho-social dysfunction, etc. Considering all the different aspects of the syndrome, perhaps a more appropriate name would be ''complex widespread pain syndrome,'' analogous to the development of the term ''complex regional pain syndrome'' that replaced the misleading terms ''reflex sympathetic dystrophy'' and ''causalgia'' (57). As the only international medical society devoted to myofascial pain syndrome and fibromyalgia syndrome, the International MYOPAIN Society could be a conduit for a change in taxonomy from ''fibromyalgia'' to ''complex widespread pain syndrome,'' or any other name that adequately reflects the etiology and complexity of the syndrome that is now known as ''fibromyalgia.'' Perhaps a consensus meeting during the 2001 MYOPAIN conference in Oregon would be the appropriate format to determine whether it is indeed time to change the taxonomy of fibromyalgia.

REFERENCES

1. Goldenberg DL: Fibromyalgia and its relation to chronic fatigue syndrome, viral illness and immune abnormalities. J Rheumatol Suppl 19: 91-93, 1989.

2. Berg PA, Klein R: Fibromyalgie-Syndrom; eine neuroendokrinologische Autoimmunerkrankung? Dtsch Med Wochenschr 119(12): 429-435, 1994.

3. Wolfe F, Ross K, Anderson J, Russell IJ, Hebert L: The prevalence and characteristics of fibromyalgia in the general population. Arthritis Rheum 38: 19-28, 1995.

4. Buskila D, Shnaider A, Neumann L, Zilberman D, Hilzenrat N, Sikuler, E: Fibromyalgia in hepatitis C virus infection. Another infectious disease relationship. Arch Intern Med 157(21): 2497-2500, 1997.

5. Clauw DJ, Schmidt M, Radulovic D, Singer A, Katz P, Bresette J: The relationship between fibromyalgia and interstitial cystitis. J Psychiatr Res 31(1): 125-131, 1997.

6. Ackenheil M: Genetics and pathophysiology of affective disorders: relationship to fibromyalgia. Z Rheumatol 57(suppl. 2): 5-7, 1998.

7. Crofford LJ: The hypothalamic-pituitary-adrenal stress axis in fibromyalgia and chronic fatigue syndrome. Z Rheumatol 57(suppl. 2): 67-71, 1998.

8. Krause K-H, Krause J, Magyarosy I, Ernst E, Pongratz D: Fibromyalgia syndrome and attention deficit hyperactivity disorder: is there a comorbidity and are there consequences for the therapy of fibromyalgia syndrome? J Musculoske Pain 6(4): 111-116, 1998.

9. Offenbaecher M, Glatzeder K, Ackenheil M: Self-reported depression, familial history of depression and fibromyalgia (FM), and psychological distress in patients with FM. Z Rheumatol 57(suppl. 2): 94-96, 1998.

10. Adler GK, Kinsley BT, Hurwitz S, Mossey CJ, Goldenberg DL: Reduced hypothalamic-pituitary and sympathoadrenal responses to hypoglycemia in women with fibromyalgia syndrome. Am J Med 106(5): 534-543, 1999.

11. Buskila D, Odes LR, Neumann L, Odes HS: Fibromyalgia in inflammatory bowel disease. J Rheumatol 26(5): 1167-1171, 1999.

12. Wolfe F, Smythe HA, Yunus MB, Bennett RM, Bombardier C, Goldenberg DL, Tugwell P, Campbell SM, Abeles M, Clark P, Fam AG, Farber SJ, Fiechtner JJ, Franklin CM, Gatter RA, Hamaty D, Lessard J, Lichtbraun AS, Masi AT, McGain GA, Reynolds WJ, Romano TJ, Russell IJ, Sheon, RP: The American College of Rheumatology 1990 Criteria for the Classification of Fibromyalgia. Report of the Multicenter Criteria Committee. Arthritis Rheum 33(2): 160-172, 1990.

13. Henriksson KG, Bengtsson A, Larsson J, Lindstrom F, Thornell LE: Muscle biopsy findings of possible diagnostic importance in primary fibromyalgia (fibrositis, myofascial syndrome). Lancet 2(8312): 1395, 1982.

14. Bartels EM, Danneskiold-Samsøe B: Histological abnormalities in muscle from patients with certain types of fibrositis. Lancet 1(8484): 755-757, 1986.

15. Bengtsson A, Henriksson KG, Larsson J: Muscle biopsy in primary fibromyalgia. Light-microscopical and histochemical findings. Scand J Rheumatol 15(1): 1-6, 1986.

16. Lund N, Bengtsson A, Thorborg P: Muscle tissue oxygen pressure in primary fibromyalgia. Scand J Rheumatol 15(2): 165-173, 1986.

17. Larsson SE, Bengtsson A, Bodegård L, Henriksson KG, Larsson J: Muscle changes in work-related chronic myalgia. Acta Orthop Scand 59(5): 552-556, 1988.

18. Bengtsson A, Henriksson, KG: The muscle in fibromyalgia–a review of Swedish studies. J Rheumatol 19(suppl): 144-149, 1989.

19. Yunus MB, Kalyan-Raman UP, Masi AT, Aldag JC: Electron microscopic studies of muscle biopsy in primary fibromyalgia syndrome: a controlled and blinded study. J Rheumatol 16(1): 97-101, 1989.

20. Jacobsen S, Bartels EM, Danneskiold-Samsøe B: Single cell morphology of muscle in patients with chronic muscle pain. Scand J Rheumatol 20(5): 336-343, 1991.

21. Schrøder HD, Drewes AM, Andreasen A: Muscle biopsy in fibromyalgia. J Musculoske Pain 1(3/4): 165-169, 1993.

22. Jubrias SA, Bennett RM, Klug GA: Increased incidence of a resonance in the phosphodiester region of 31P nuclear magnetic resonance spectra in the skeletal muscle of fibromyalgia patients. Arthritis Rheum 37(6): 801-807, 1994.

23. Nørregaard J, Harreby M, Amris K, Bangsbo J, Bartels EM, Danneskiold-Samsøe B, Single cell morphology and high-energy phosphate levels in quadriceps muscles from patients with fibromyalgia. J Musculoske Pain 2(2): 45-51, 1994.

24. Sprott H, Müller A, Heine H: Collagen crosslinks in fibromyalgia. Arthritis Rheum 40(8): 1450-1454, 1997.

25. Mengshoel AM: Fibromyalgia and responses to exercise. J Manual & Manipulative Therapy 6(3): 144-150, 1998.

26. Pongratz DE, Späth M: Morphologic aspects of fibromyalgia. Z Rheumatol 57(suppl. 2): 47-51, 1998.

27. Sietsema KE, Cooper DM, Caro X, Leibling MR, Louie JS: Oxygen uptake during exercise in patients with primary fibromyalgia syndrome. J Rheumatol 20(5): 860-865, 1993.

28. Nørregaard J, Bulow PM, Mehlsen J, Danneskiold-Samsøe B: Biochemical changes in relation to a maximal exercise test in patients with fibromyalgia. Clin Physiol 14(2): 159-167, 1994.

29. Simms RW, Roy SH, Hrovat M, Anderson JJ, Skrinar G, LePoole SR, Zerbini CA, de Luca C, Jolesz F: Lack of association between fibromyalgia syndrome and abnormalities in muscle energy metabolism. Arthritis Rheum 37(6): 794-800, 1994.

30. Simms RW: Muscle studies in fibromyalgia. J Musculoske Pain 2(3): 117-123, 1994.

31. Mengshoel AM, Saugen E, Forre O, Vollestad NK: Muscle fatigue in early fibromyalgia. J Rheumatol 22(1): 143-150, 1995.

32. Vestergaard-Poulsen P, Thomsen C, Nørregaard, J, Bulow P, Sinkjaer T, Henriksen O: 31P NMR spectroscopy and electromyography during exercise and recovery in patients with fibromyalgia. J Rheumatol 22(8): 1544-1551, 1995.

33. Simms RW: Is there muscle pathology in fibromyalgia syndrome? Rheum Dis Clin North Am 22(2): 245-266, 1996.

34. Cohen ML, Sheather-Reid RB, Arroyo JF, Champion GD: Evidence for abnormal nociception in fibromyalgia and repetitive strain injury. J Musculoke Pain 3(2): 49-57, 1995.

35. McDermid AJ, Rollman GB, McCain GA: Generalized hypervigilance in fibromyalgia: evidence of perceptual amplification. Pain 66(2-3): 133-144, 1996.

36. Bendtsen L, Nørregaard J, Jensen R, Olesen J: Evidence of qualitatively altered nociception in patients with fibromyalgia. Arthritis Rheum 40(1): 98-102, 1997.

37. Lorenz J: Hyperalgesia or hypervigilance? An evoked potential approach to the study of fibromyalgia syndrome. Z Rheumatol 57(suppl. 2): 19-22, 1998.

38. Vecchiet L, Pizzigallo E, Iezzi S, Affaitati G, Vecchiet J, Giamberardino MA: Differentiation of sensitivity in different tissues and its clinical significance. J Musculoske Pain 6(1): 33-45, 1998.

39. Kosek E, Ekholm J, Hansson P: Increased pressure pain sensibility in fibromyalgia patients is located deep to the skin but not restricted to muscle tissue. Pain 63(3): 335-339, 1995.

40. Kosek E, Ekholm J, Hansson P: Modulation of pressure pain thresholds during and following isometric contraction in patients with fibromyalgia and in healthy controls. Pain 64(3): 415-423, 1996.

41. Gibson SJ, Littlejohn GO, Gorman MM, Helme RD, Granges G: Altered heat pain thresholds and cerebral event-related potentials following painful CO2 laser stimulation in subjects with fibromyalgia syndrome. Pain 58(2): 185-193, 1994.

42. Nørregaard J, Bendtsen L, Lykkegaard J, Jensen R: Pressure and heat pain thresholds and tolerances in patients with fibromyalgia. J Musculoske Pain 5(2): 43-53, 1996.

43. Wolfe F: Fibromyalgia and problems in classification of musculoskeletal disorders. Progress in fibromyalgia and myofascial pain. Pain research and clinical management. Edited by H Værøy, H Merskey. Elsevier, Amsterdam, 1993, pp. 217-235.

44. Graven-Nielsen T, Sörensen J, Henriksson KG, Bengtsson M, Arendt-Nielsen L: Central hyperexcitability in fibromyalgia. J Musculoske Pain 7(1/2): 261-271, 1999.

45. Værøy H, Helle R, Forre O, Kass E, Terenius L: Elevated CSF levels of substance P and high incidence of Raynaud phenomenon in patients with fibromyalgia: new features for diagnosis. Pain 32(1): 21-26, 1988.

46. Russell IJ, Orr MD, Littman B, Vipraio GA, Alboukrek D, Michalek JE, Lopez Y, MacKillip F: Elevated cerebrospinal fluid levels of substance P in patients with the fibromyalgia syndrome. Arthritis Rheum 37(11): 1593-601, 1994.

47. Welin M, Bragee B, Nyberg F, Kristiansson M: Elevated substance P levels are contrasted by a decrease in met-enkephalin-arg-phe levels in csf from fibromyalgia patients. J Musculoske Pain 3(3): 4 (abstract), 1995.

48. Russell IJ: Neurochemical pathogenesis of fibromyalgia syndrome. J Musculoske Pain 7(1/2): 183-191, 1999.

49. Hrycaj P, Stratz T, Muller W: Platelet 3H-imipramine uptake receptor density and serum serotonin levels in patients with fibromyalgia/fibrositis syndrome. J Rheumatol 20(11): 1986-1988, 1993.

50. Russell IJ, Vipraio GA, Acworth I: Abnormalities in the central nervous system (CNS) metabolism of tryptophan (TRY) to 3-hydroxy kynurenine (OHKY) in fibromyalgia syndrome (FS). Arthritis Rheum 36(9): S222 (abstract), 1993.

51. Stratz T, Samborski W, Hrycaj P, Pap T, Mackiewicz S, Mennet P, Müller W: Die Serotoninkonzentration im Serum bei Patienten mit generalisierter Tendomyopathie (Fibromyalgie) und chronischer Polyarthritis. Med Klin 88(8): 458-462, 1993.

52. Russell IJ: Biochemical abnormalities in fibromyalgia syndrome. J Musculoske Pain 2(3): 101-115, 1994.

53. Russell IJ: Substance P and fibromyalgia. J Musculoske Pain 6(3): 29-35, 1998.

54. Neeck G, Riedel W: Hormonal pertubations in fibromyalgia syndrome. Ann N Y Acad Sci 876: 325-338, 1999.

55. Bonica JJ: Definitions and taxonomy of pain. The management of pain. Edited by JJ Bonica, JD Loesser, CR Chapman, WE Fordyce. Lea & Febiger, Philadelphia, 1990, pp. 18-27.

56. Russell IJ: Neurochemical pathogenesis of fibromyalgia syndrome. J Musculoske Pain 4(1/2): 61-92, 1996.

57. Stanton-Hicks M, Jänig W, Hassenbusch S, Haddox JD, Boas R, Wilson P: Reflex sympathetic dystrophy: changing concepts and taxonomy. Pain 63(1): 127-133, 1995.