

Research Abstracts On Young People With Fibromyalgia

The abstracts in this collection have been selected by the National Fibromyalgia Partnership (NFP) from the extensive literature on fibromyalgia and related conditions so as to cover a wide range of subjects in limited space. Entries are included in alphabetical order by lead author. To obtain the full text of these abstracts, visit a medical library, use a document delivery service, or check with your local library about an interlibrary loan of material. For more information on fibromyalgia or the NFP, visit: www.fmpartnership.org or send a self-addressed, stamped envelope to: NFP, Inc., P.O. Box 160, Linden, VA 22642-0160 USA.

ARNOLD LM, HUDSON JI, HESS EV, WARE AE, FRITZ DA, AUCHENBACH MB, STARCK LO, KECK PE

Family Study of Fibromyalgia

OBJECTIVE: To assess for familial aggregation of fibromyalgia (FM) and measures of tenderness and pain, and for familial coaggregation of FM and major mood disorder (major depressive disorder or bipolar disorder). **METHODS:** Probands meeting the American College of Rheumatology criteria for FM and control probands with rheumatoid arthritis (RA) and no lifetime diagnosis of FM were recruited from consecutive referrals to 2 community-based rheumatology practices. Probands were ages 40-55 years and had at least 1 first-degree relative age 18 years or older who was available for interview and examination. All probands and interviewed relatives underwent a dolorimeter tender point examination and a structured clinical interview. Interviewed relatives were asked about first-degree relatives who were not available for interview, using a structured family interview. Logistic and linear regression models, adjusting for the correlation of observation within families, were applied to study the aggregation and coaggregation effects. **RESULTS:** Information was collected for 533 relatives of 78 probands with FM and 272 relatives of 40 probands with RA. FM aggregated strongly in families: the odds ratio (OR) measuring the odds of FM in a relative of a proband with FM versus the odds of FM in a relative of a proband with RA was 8.5 (95% confidence interval [95% CI] 2.8-26, $P = 0.0002$). The number of tender points was significantly higher, and the total myalgic score was significantly lower in the relatives of probands with FM compared with the relatives of probands with RA. FM coaggregated significantly with major mood disorder: the OR measuring the odds of major mood disorder in a relative of a proband with FM versus the odds of major mood disorder in a relative of a proband

with RA was 1.8 (95% CI 1.1-2.9, P = 0.013). CONCLUSION: FM and reduced pressure pain thresholds aggregate in families, and FM coaggregates with major mood disorder in families. These findings have important clinical and theoretical implications, including the possibility that genetic factors are involved in the etiology of FM and in pain sensitivity. In addition, mood disorders and FM may share some of these inherited factors.

[In: *Arthritis Rheum* (2004 Mar) 50(3):944-52--Comment in: *Arthritis Rheum* 2004 Sep;50(9):3059-60; author reply 3060]

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BELL DS, BELL KM, CHENEY PR
Primary Juvenile Fibromyalgia Syndrome and Chronic Fatigue Syndrome in Adolescents

Chronic fatigue syndrome (CFS) and primary juvenile fibromyalgia syndrome (PJFS) are illnesses with a similar pattern of symptoms of unknown etiology. Twenty-seven children for whom CFS was diagnosed were evaluated for fibromyalgia by the presence of widespread pain and multiple tender points. Eight children (29.6%) fulfilled criteria for fibromyalgia. Those children who met fibromyalgia criteria had a statistically greater degree of subjective muscle pain, sleep disturbance, and neurological symptoms than did those who did not meet the fibromyalgia criteria. There was no statistical difference between groups in degree of fatigue, headache, sore throat, abdominal pain, depression, lymph node pain, concentration difficulty, eye pain, and joint pain. CFS in children and PJFS appear to be overlapping clinical entities and may be indistinguishable by current diagnostic criteria.

[In: *Clin Infect Dis* (1994 Jan) 18 Suppl 1:S21-3]

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BREAU LM, MCGRATH PJ, JU LH
Review of Juvenile Primary Fibromyalgia and Chronic Fatigue Syndrome

This article reviews the current literature on childhood fibromyalgia and chronic fatigue syndrome. In doing so, it questions assumptions about the presumed nature of the disorders-that they are distinct from each other and are duplicates of their adult counterparts. It also attempts to synthesize the available data to reach some preliminary judgments about these disorders: that fibromyalgia and chronic fatigue syndrome may be related in children and may not be

duplicates of the adult disorders; that psychological and psychosocial factors are unlikely contributors to the etiology of these disorders; and that the evidence is increasingly pointing to a role for genetic factors in their etiology. A discussion of the research into treatments for childhood fibromyalgia and chronic fatigue syndrome highlights the lack of well-designed, controlled studies. Finally, directions for future research are offered where results of the current literature are unclear.

[In: *J Dev Behav Pediatr* (1999 Aug) 20(4):278-88]

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BUSKILA D, NEUMANN L

Fibromyalgia Syndrome (FM) and Nonarticular Tenderness in Relatives of Patients with FM

OBJECTIVE: To determine the prevalence of fibromyalgia (FM) and to assess nonarticular tenderness in relatives of patients with FM.

METHODS: Thirty female patients with FM randomly chosen from 117 of their close relatives (parents, brothers, sisters, children, husbands) were assessed for nonarticular tenderness. A count of 18 tender points was conducted by thumb palpation, and tenderness thresholds were assessed by dolorimetry at 9 tender sites. FM was diagnosed according to the 1990 American College of Rheumatology criteria. **RESULTS:** The prevalence of FM among blood relatives of patients with FM was 26%, and among their husbands 19%. FM prevalence in male relatives was 14%, and in female relatives 41%. The mean tender point counts of male and female young relatives was significantly higher than that of controls: 6.1 vs 0.2 ($p < 0.01$), and 4.4 vs 0.4 ($p < 0.01$) respectively. Similarly, adult relatives had considerably higher mean tender point counts than controls: 4.0 vs 0.04 ($p < 0.01$) and 10.3 vs 0.28 ($p < 0.01$) respectively, for males and females. **CONCLUSION:** Relatives of patients with FM have a higher prevalence of FM and are more tender than the general population, as recently reported and shown in a healthy control group. This finding can be attributed to genetic and environmental factors.

[In: *J Rheumatol* (1997 May) 24(5):941-4]

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BUSKILA D, PRESS J, GEDALIA A, KLEIN M, NEUMANN L, BOEHM R, SUKENIK S
Assessment of Nonarticular Tenderness and Prevalence of Fibromyalgia in Children

Fibromyalgia syndrome (FS) is most common in midlife, but may be seen at any age. Its prevalence and assessment of tenderness in healthy children is not known. We assessed 338 healthy schoolchildren for tenderness thresholds and prevalence of FS. In all children a point count of 18 tender points (TP) was conducted by thumb palpation and tenderness of some of the TP sites as well as control point sites was further assessed using a Chatillon dolorimeter. All children and their parents were questioned about the presence of widespread pain or aching. Children were considered to have FS if they met the American College of Rheumatology (ACR) criteria for diagnosis of FS. Of the 338 children, 21 (6.2%) had FS. Thresholds of tenderness of 9 TP were 5.0 (1.2) (kg) [mean (standard deviation)] for boys vs 3.6 (0.8) (kg) for girls ($p < 0.001$). Thresholds of tenderness of the control point sites were 7.1 (1.4) (kg) for boys vs 5.5 (1.1) (kg) for girls ($p < 0.001$). Thresholds of tenderness of TP and control points in the children with FS were 2.5 (0.4) (kg) and 4.2 (0.5) (kg) vs 4.5 (1.2) (kg) and 6.6 (1.4) (kg) respectively in the children without FS ($p < 0.001$). We suggest that FS is common in the pediatric age group. Boys have lower tenderness than girls; children with FS have lower thresholds for tenderness both at control and TP compared to the subjects without FS.

[In: *J Rheumatol* (1993 Feb) 20(2):368-70]

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BUSKILA D, NEUMANN L, HAZANOV I, CARMİ R
Familial Aggregation in the Fibromyalgia Syndrome

The authors studied the familial occurrence of fibromyalgia (FMS) to determine a possible role of genetic and familial factors in this syndrome. Fifty-eight offspring aged 5 to 46 years (35 males and 23 females) from 20 complete nuclear families ascertained through affected mothers with FMS were clinically evaluated for FMS according to the ACR 1990 diagnostic criteria. FMS symptoms, quality of life, physical functioning, and dolorimetry thresholds were assessed in all subjects. Sixteen offspring (28%) were found to have FMS. The M/F ratio among the affected was 0.8 compared with 1.5 in the whole study group. Offspring with and without FMS did not differ on anxiety,

depression, global well-being, quality of life, and physical functioning. A high prevalence of FMS was observed among offspring of FMS mothers. Because psychological and familial factors were not different in children with and without FMS, the high familial occurrence of this syndrome may be attributable to genetic factors. [In: *Semin Arthritis Rheum* (1996 Dec) 26(3):605-11]

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BUSKILA D, SARZI-PUTTINI P

Biology and Therapy of Fibromyalgia. Genetic Aspects of Fibromyalgia Syndrome

Genetic and environmental factors may play a role in the etiopathology of fibromyalgia syndrome (FMS) and other related syndromes. There is a high aggregation of FMS in families of FMS patients. The mode of inheritance is unknown but it is most probably polygenic. There is evidence that polymorphisms of genes in the serotonergic, dopaminergic and catecholaminergic systems play a role in the etiology of FMS. These polymorphisms are not specific for FMS and are associated with other functional somatic disorders and depression. Future genetic studies in the field of FMS and related conditions should be conducted in larger cohorts of patients and ethnically matched control groups.

Registry Numbers: EC 2.1.1.6 (Catechol O-Methyltransferase)
[In: *Arthritis Res Ther* (2006) 8(5):218]

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DAVIES S, CRAWLEY E

Chronic Fatigue Syndrome in Children Aged 11 Years Old and Younger

Children in primary school can be very disabled by chronic fatigue syndrome or ME (CFS/ME). The clinical presentation in this age group (under 12 years old) is almost identical to that in older children. AIM: To describe children who presented to the Bath paediatric CFS/ME service under the age of 12 years. METHOD: Inventories measuring fatigue, pain, functional disability, anxiety, family history and symptoms were collected prospectively for all children presenting to the Bath CFS/ME service between September 2004 and April 2007. Data from children who presented to the service under the age of 12 are described and compared to those who presented at age 12 or older. RESULTS: 178 children (under the age of 18) were diagnosed as having

CFS/ME using the RCPCH criteria out of 216 children assessed. The mean age at assessment for children with CFS/ME was 14.5 years old (SD 2.9). Thirty-two (16%) children were under 12 years at the time of assessment, four children were under 5 years and the youngest child was 2 years old. Children under 12 were very disabled with mean school attendance of just over 40% (average 2 days a week), Chalder fatigue score of 8.29 (CI 7.14 to 9.43 maximum possible score = 11) and pain visual analogue score of 39.7 (possible range 0-100). Comparison with children aged 12 or older showed that both groups were remarkably similar at assessment. Twenty-four out of the 26 children with complete symptom lists would have been diagnosed as having CFS/ME using the stricter adult Centers of Disease Control and prevention (CDC) criteria. **CONCLUSION:** Disability in the under-12 age group was high, with low levels of school attendance, high levels of fatigue, anxiety, functional disability and pain. The clinical pattern seen is almost identical to that seen in older children, and the majority of children would also be diagnosed as having CFS/ME using the stricter adult definition.
In: *Arch Dis Child* (2008 May) 93(5):419-21

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DEGOTARDI PJ, KLASS ES, ROSENBERG BS, FOX DG, GALLELLI KA, GOTTLIEB BS
Development and Evaluation of a Cognitive-Behavioral Intervention for Juvenile Fibromyalgia

OBJECTIVE: To describe the development and test the efficacy of a cognitive-behavioral intervention (CBT) for juvenile fibromyalgia.
METHOD: Sixty-seven children with fibromyalgia and their parents were recruited to participate in an 8-week intervention that included modules of pain management, psychoeducation, sleep hygiene, and activities of daily living. Children were taught techniques of cognitive restructuring, thought stopping, distraction, relaxation, and self-reward. Additionally, they kept daily pain and sleep diaries. Children completed questionnaires of pre- and post-treatment measuring physical status and psychological functioning. **RESULTS:** Following CBT, children reported significant reductions ($p < .006$) in pain, somatic symptoms, anxiety, and fatigue, as well as improvements in sleep quality. Additionally, children reported improved functional ability and had fewer school absences. **CONCLUSION:** Children with fibromyalgia can be taught CBT strategies that help them effectively manage this chronic and disabling musculoskeletal pain disorder.
[In: *J Pediatr Psychol* (2006 Aug) 31(7):714-23]

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ECCLESTON C, WASTELL S, CROMBEZ G, JORDAN A
Adolescent Social Development and Chronic Pain

Adolescents with chronic pain report disability, distress and reduced social functioning. A clinical sample of 110 adolescents, with a mean four year history of pain, was investigated for the psychosocial impact of pain on social development. All participants completed a range of self-report measures of pain intensity, disability, distress, social and family functioning. Also completed was the Bath Adolescent Pain Questionnaire, including its development subscale. The development subscale measures the extent to which adolescents perceive themselves to be ahead or behind their peers on 11 aspects of social development. Three related analyses were undertaken. First, over 50% of adolescents reported themselves to be less developed than their peers on four or more aspects. The item with the highest endorsement of being ahead compared with peers was 51dealing with problems51. Second, factor analyses revealed three factors of adolescent social development labelled 'independence', 'emotional adjustment' and 'identity formation'. Third, regression analyses revealed that peer support had a positive effect on all three factors, disability and anxiety had a negative effect on perceptions of independence, greater family dysfunction had a negative effect on emotional adjustment, and depressive mood had a negative effect on identity formation. Pain intensity had a negative effect on all three factors. Findings suggest that adolescents with chronic pain judge themselves to be less developed than their peers. Pain intensity has a negative effect on this perception, but peer relations may play a protective role: strong peer relationships are associated with positive social comparisons of the level of social development.
 In: *Eur J Pain* (2008 Aug) 12(6):765-74

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ERASO RM, BRADFORD NJ, FONTENOT CN, ESPINOZA LR, GEDALIA A
Fibromyalgia Syndrome in Young Children: Onset at Age 10 Years and Younger

OBJECTIVE: To report our experience of fibromyalgia syndrome (FMS) in young children with onset at age 10 years and younger as compared to older children. **METHODS:** Clinical and laboratory data were reviewed in all patients that had been diagnosed with FMS between November 1994 and March 2003. Patients with onset above the of age 18 years, and patients with FMS and concomitant rheumatic diseases were

excluded from this study. The study population included two groups: group 51A51, young children with onset at age 10 years and under and group 51B51, children with onset above 10 years old. A questionnaire was used at follow-up visits or by telephone interview to evaluate the outcome. RESULTS: There were 148 children with the diagnosis of FMS (based on ACR criteria), of these 46 children in group A and 102 children in group B. The mean age at onset and mean age at diagnosis were 7.5 years and 10 years in group A, and 13.2 years and 14.5 years in B, respectively. The mean interval between the age of onset and the age at diagnosis was 32 months in group A, and 18 months in group B ($p= 0.007$). There was a predominance of female gender and Caucasian ethnicity in both groups. Diffuse aching was reported in all patients in both groups. Stiffness, subjective joint swelling, abdominal pain and initial presentation on wheelchair were found more frequently in group A, compared with group B ($p= 0.03, 0.001, 0.01, 0.03$ respectively). The mean count of tender points at diagnosis was higher in group A, compared with group B (15.3 vs. 14.2, $p = 0.004$). The differences of other clinical features and laboratory tests in both groups were not statistically significant. Thirty-six patients in group A (78%) and 83 in group B (81%) were available for one or more follow-up visits and/or telephone interview. The mean follow-up period was 14 months in group A, and 19 months in group B (p value = 0.3). There was no difference in the type of treatment or outcome in both groups. CONCLUSION: FMS in young children of 10 years old and younger is frequently under-recognized. As compared with the older group, stiffness, subjective joint swelling, abdominal pain, initial presentation on wheelchair and a higher mean count of tender points at diagnosis were significantly more common in the younger age group. However, the type of medications used and outcome were similar in both groups. Prospective studies with large patient population are needed to clarify these findings.

[In: *Clin Exp Rheumatol* (2007 Jul-Aug) 25(4):639-44]

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GANSKY SA, PLESH O

Widespread Pain and Fibromyalgia in a Biracial Cohort of Young Women

OBJECTIVE: To assess the distribution of widespread pain, tenderpoints (TP), and fibromyalgia (FM) in young African American (AA) and Caucasian (C) women. METHODS: A community population of 1334 young (21-26 yrs old) women (684 AA and 650 C) was surveyed and classified for body pain spread [chronic widespread pain (CWP), axial regional chronic pain (RCP), nonaxial RCP, or no pain]. Of these women, 553 were examined for TP based on American College of Rheumatology criteria. RESULTS: Overall, 5.6% reported CWP, while 22%

reported axial RCP, and 16% reported nonaxial RCP. From the CWP group, 57% were confirmed as FM cases. C women had significantly more TP and greater TP pain score than AA women ($p \leq 0.005$). Overall FM prevalence was 2.4% (95% confidence interval: 1.7-3.5%), with 3.0% in AA and 2.0% in C women. Increase in body pain and tenderness was significantly associated with decreased subjective socioeconomic status (SSS), worse self-reported health, greater impact of premenstrual symptoms on activities, and greater depressive symptoms. The effect of depressive symptoms on pain differed by race.

CONCLUSIONS: Widespread pain and tenderness is highly prevalent in these young women. Racial differences seem to exist; C women had significantly increased tenderness while AA women had more widespread pain. The association of depressive symptoms and pain was stronger in AA women. Racial differences emerged relatively early in these young women.

[In: *J Rheumatol* (2007 Apr) 34(4):810-7]

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GEDALIA A, PRESS J, KLEIN M, BUSKILA D

Joint Hypermobility and Fibromyalgia in Schoolchildren

OBJECTIVES--To test the hypothesis that joint hypermobility may play a part in the pathogenesis of pain in fibromyalgia, schoolchildren were examined for the coexistence of joint hypermobility and fibromyalgia. **METHODS--**The study group consisted of 338 children (179 boys, 159 girls; mean age 11.5 years, range 9-15 years) from one public school in Beer-Sheva, Israel. In the assessment of joint hypermobility, the criteria devised by Carter and Bird were used. Any child who met at least three of five criteria was considered to have joint hypermobility. Children were considered to have fibromyalgia if they fulfilled the 1990 American College of Rheumatology criteria for the diagnosis of fibromyalgia, namely, widespread pain in combination with tenderness of 11 or more of the 18 specific tender point sites. The blind assessments of joint hypermobility (by AG) and fibromyalgia (by DB) were carried out independently. **RESULTS--**Of the 338 children 43 (13%) were found to have joint hypermobility and 21 (6%) fibromyalgia; 17 (81%) of the 21 with fibromyalgia had joint hypermobility and 17 (40%) of the 43 with joint hypermobility had fibromyalgia. Using chi 2 statistical analysis, joint hypermobility and fibromyalgia were found to be highly associated. **CONCLUSIONS--**This study suggests that there is a strong association between joint hypermobility and fibromyalgia in schoolchildren. It is possible that joint hypermobility may play a part in the pathogenesis of pain in fibromyalgia. More studies are needed to establish the clinical

significance of this observation.
 [In: *Ann Rheum Dis* (1993 Jul) 52(7):494-6]

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GEDALIA A, GARCIA CO, MOLINA JF, BRADFORD NJ, ESPINOZA L
Fibromyalgia Syndrome: Experience in a Pediatric Rheumatology Clinic

OBJECTIVE: To report our experience of fibromyalgia syndrome (FMS) in pediatric rheumatology clinic settings. **METHODS:** Clinical and laboratory data were reviewed in all patients with FMS between March 1992 and March 1996. Patients with FMS and an underlying rheumatic disease were excluded from the study. At presentation and follow-up visits, all patients had a tender points (TP) count that was conducted by thumb palpation. Both the children and their parents were questioned concerning the presence of widespread pain or aching. All the patients fulfilled the ACR criteria for the diagnosis of primary FMS. All children were evaluated by a protocol that included relevant information on FMS. Telephone survey questionnaires were used for patients who missed some of their follow-up visits. **RESULTS:** There were 59 children (47 F and 12 M) diagnosed with primary FMS. The mean age at onset was 13.7 years, and the mean age at diagnosis was 15.5 years. The mean duration of follow-up was 18.3 months. Diffuse aching was reported in 57 patients (97%), headaches in 45 (76%), and sleep disturbances in 41 (69%). Less common were stiffness in 17 (29%), subjective joint swelling in 14 (24%), fatigue in 12 (20%), abdominal pain in 10 (17%), and joint hypermobility and depression in 8 (14%) and 4 (7%) patients, respectively. The mean ESR was 15 mm/h, RF was negative in all patients, and ANA was positive (mean titer 1:160) in 17 patients. The mean initial TP count was 14.6. Nine patients were not available for follow-up. There were 50 patients available for follow-up and survey analysis, and of these 30 (60%) had improved, while 18 (36%) remained unchanged, and 2 (4%) became worse when compared with initial presentation. At the end of study follow-up, 37 patients (74%) were still taking medication (20 of them daily). Out of 25 patients whose TP counts were available at the end of follow-up, the mean TP dropped from 14.12 to 12.04 ($p = 0.09$) for the total group, and 14.05 to 10.84 ($p < 0.01$) for the patients who had improved. 22 out of 30 patients in the improved group and 7 out of 20 in the unchanged or worse group had continued active exercise programs ($p < 0.001$). **CONCLUSION:** The clinical spectrum of FMS in children is similar to that of adults but with better outcomes. The TP count correlates with clinical status only in patients who had improved. Active exercise programs seem to correlate with better outcomes. Prospective and larger patient population

studies, and a longer follow-up of children with FMS are needed to clarify these findings. *Registry Numbers: 9009-79-4 (Rheumatoid Factor)*
 [In: *Clin Exp Rheumatol* (2000 May-Jun) 18(3):415-9]

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JACKSON EL

The Effects on Siblings in Families with a Child with Chronic Fatigue Syndrome

Paediatric CFS/ME is a stressor, which affects not only the sufferer but also the whole family. The sibling bond exerts a great influence on all the children in the family. Healthy siblings are often overlooked as attention is focused on the child with CFS/ME or other chronic illness. Individual children react in different ways to serious illness in another sibling by adopting a variety of coping mechanisms. There is a need for health and education professionals to consider the whole family when caring for and working with a child with CFS/ME.

[In: *J Child Health Care* (1999 Summer) 3(2):27-32]

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KASHIKAR-ZUCK S, LYNCH AM, GRAHAM TB, SWAIN NF, MULLEN SM, NOLL RB

Social Functioning and Peer Relationships of Adolescents with Juvenile Fibromyalgia Syndrome

OBJECTIVE: To assess peer relationships of adolescents with juvenile primary fibromyalgia syndrome (JPFS) compared with matched classroom comparison peers (MCCPs) without a chronic illness. JPFS is characterized by chronic musculoskeletal pain, sleep disturbance, fatigue, and difficulty with daily functioning. Adolescents with JPFS often report problems with school and participating in peer activities, placing them at risk for social isolation from their peers and psychosocial adjustment problems. **METHODS:** Participants were 55 adolescents with JPFS (ages 12-18 years) from a pediatric outpatient rheumatology clinic and 55 MCCPs. Data on peer reputation and peer acceptance were collected from teachers, peers, and self report in a classroom setting with no focus on JPFS. **RESULTS:** Adolescents with JPFS were perceived (by peer and self reports) as being more isolated and withdrawn and less popular. Adolescents with JPFS were less well liked, were selected less often as a best friend, and had fewer reciprocated friendships. **CONCLUSION:** Our findings suggest that adolescents with JPFS are experiencing problems with

peer relationships. Given the central role that peer relationships play in psychological development of children, and because peer rejection and isolation have been associated with subsequent adjustment problems, these findings are concerning. Longitudinal studies of adolescents with JPFS are needed to ascertain whether these patients are at long-term risk and will provide a foundation for the need for early interventions. Results are discussed within the context of earlier findings for other adolescents with chronic illness and rheumatic conditions, such as juvenile idiopathic arthritis, who demonstrated no social problems.

[In: *Arthritis Rheum* (2007 Apr 15) 57(3):474-80]

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KEOGH E, ECCLESTON C

Sex Differences in Adolescent Chronic Pain and Pain-Related Coping

Sex differences exist in pain and the strategies used to cope with pain. Although it has been proposed that such differences become apparent around puberty, somewhat surprisingly very little research has specifically investigated sex as a moderator of pain within adolescents. The primary aim of the current study was to investigate sex differences in pain and coping within a group of 46 male and 115 female adolescent chronic pain sufferers. All were aged between 11 and 19 years and had been referred to the Pain Management Unit at the Royal National Hospital for Rheumatic Diseases, United Kingdom. Patients completed a battery of measures including pain experiences and a pain coping questionnaire. No sex differences were found in pain chronicity, although males and females did differ in self-reported pain experiences (females reported higher pain). Sex differences were also found in coping behaviours. Females used more social support, positive statements and internalizing/catastrophizing, whereas males reported engaging in more behavioural distraction. Of these strategies internalizing/catastrophizing was found to mediate the relationship between sex and pain. This suggests that not only do sex differences exist in the pain experiences and pain-coping strategies of adolescents with chronic pain, but that internalizing/catastrophizing may be an important mechanism in understanding such differences. More research examining potential sex differences in children and adolescents is recommended.

In: *Pain* (2006 Aug) 123(3):275-84

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LEWIN DS, DAHL RE

Importance of Sleep in the Management of Pediatric Pain

This article outlines several aspects of sleep regulation relevant to pediatric pain management. A broad range of connections between sleep and pain are described: (1) pain can interfere with the quality and quantity of children's sleep; (2) insufficient sleep (quality or quantity) can cause daytime sequelae (behavioral and emotional changes) that interfere with the coping skills necessary for effective pain management; (3) fear and anxiety often have a negative impact on both pain and sleep; (4) feelings of safety and control frequently have a positive effect on both sleep and pain symptoms; (5) adequate sleep seems to promote both physiological (tissue repair) and psychological (transient cessation of the perception of pain signals) processes relevant to recovery from pain, injury, and illness; and (6) treatment approaches to pediatric sleep and pain problems show considerable overlap with respect to many pharmacological as well as cognitive-behavioral interventions. Given these multiple links, a better understanding of sleep--and its importance in physical and mental health--is likely to be of value to clinicians and researchers working in areas of pediatric pain management. One specific hypothesis to be addressed is the possible contribution of sleep disruption as a step in the progression to some chronic pain syndromes.

[In: *J Dev Behav Pediatr* (1999 Aug) 20(4):244-52]

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LIEDBERG GM, BURCKHARDT CS, HENRIKSSON CM

Young Women with Fibromyalgia in the United States and Sweden: Perceived Difficulties During the First Year after Diagnosis

PURPOSE: The major symptoms of fibromyalgia (FM)--pain, tiredness, disrupted sleep, and muscle weakness--severely impact everyday activities, including the paid work role of women who have had FM for a long time. There are no prospective studies on young and newly diagnosed women with FM. The aim of the present study was to describe and compare difficulties young and newly diagnosed women in Sweden and the United States experienced during their first year after diagnosis. **METHOD:** Three interviews, 6 months apart, were conducted, with 49 Swedish and 45 US women between the ages of 18 and 39. Five open-ended questions were asked concerning physical, psychological and social difficulties and limitations, and factors that increased

or decreased their difficulties and limitations. At interviews 2 and 3 the women were also asked about ways of preventing their difficulties. The answers were written down and analysed by a content analysis approach. **RESULTS:** Consistent categories of difficulties were reported: symptoms, movements, activities, moods, social network, external factors and coping strategies. More US women were working outside their homes than were their Swedish counterparts and they expressed more difficulties compared with the Swedish women. **CONCLUSIONS:** In general, difficulties decreased and coping strategies increased over the 1-year period in both groups of newly diagnosed, young women.

[In: *Disabil Rehabil* (2006 Oct 15) 28(19):1177-84]

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LOGAN DE, CATANESE SP, COAKLEY RM, SCHARFF L

Chronic Pain in the Classroom: Teachers' Attributions about the Causes of Chronic Pain

BACKGROUND: School absenteeism and other impairments in school function are significant problems among children with chronic pain syndromes; yet, little is known about how chronic pain is perceived in the school setting. The purpose of this study was to examine teachers' attributions about the causes of chronic pain in adolescent students. **METHODS:** Classroom teachers (n = 260) read vignettes describing a hypothetical student with limb pain. They were presented with a list of possible physical and psychological causes for the pain and asked to identify the causes to which they attributed the pain. Vignettes varied by the presence or absence of (1) documented medical evidence for the pain and (2) communication from the medical team. Teachers also responded to questions assessing their responses to the student in terms of support for academic accommodations and sympathy for the student. **RESULTS:** Teachers tended to endorse a dualistic (ie, either physical or psychological) model for pain rather than a biopsychosocial model. Documented medical evidence supporting the pain was the most influential factor affecting teachers' attributions about chronic pain. Teachers who attributed the pain to physical causes-either in isolation or in combination with psychological causes-responded more positively toward the student. **CONCLUSIONS:** Many teachers lack a biopsychosocial framework through which to understand chronic pain syndromes in students. How chronic pain is described to school personnel may affect how teachers understand the pain and respond to it.

In: *J Sch Health* (2007 May) 77(5):248-56

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LOGAN DE, SIMONS LE, STEIN MJ, CHASTAIN L
School Impairment in Adolescents with Chronic Pain

The purpose of this study was to assess and describe school functioning among adolescents presenting for evaluation in a tertiary care pediatric chronic pain clinic. Adolescents (n = 220, aged 12-17) and their parents participated in the study, providing self-reported data on school attendance, school performance, and perceived academic competence. Participants' schools provided official attendance records, descriptions of accommodations implemented to address the student's pain problems in the school setting, and teacher ratings of academic competence. Results show that many adolescents with chronic pain miss a significant amount of school, experience a decline in grades, and perceive pain to interfere with their school success. Various indicators of school impairment are highly intercorrelated, suggesting that impairment or success in 1 domain is typically associated with similar patterns in other domains of school functioning. However, as a group, adolescents with pain are viewed by themselves and their teachers as academically competent. Strong correlations emerged between different reporters of school functioning indicators such as attendance, suggesting that reliance on parent or adolescent reporting may be sufficient when assessing these domains. Findings underscore the importance of broadly assessing school functioning in adolescents with chronic pain. PERSPECTIVE: This study extends our understanding of school functioning among adolescents with chronic pain. It highlights the need to assess both school attendance and performance in this population as well as how schools respond to pain problems. Devising summary indicators of school impairment can be useful in both clinical and research contexts.

In: *J Pain*. 2008 May;9(5):407-16. Epub 2008 Feb 6

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LYNCH AM, KASHIKAR-ZUCK S, GOLDSCHNEIDER KR, JONES BA
Sex and Age Differences in Coping Styles among Children with Chronic Pain

The purpose of this study was to examine sex and age differences in coping strategies among pediatric patients with chronic pain. Sex differences are reported in the adult pain and coping literatures, but little attention has been given to possible distinctions in coping styles in the pediatric chronic pain population. Investigating pain coping skills at an early age may provide clinicians with a better understanding of the evolution of characteristic coping styles and identify areas for intervention. Pain intensity (Visual Analog Scale), pain coping strategies (Pain Coping Questionnaire), and coping efficacy were assessed in children (ages 8-12 years) and

adolescents (ages 13-18 years), presenting to a pediatric chronic pain clinic (n=272). Significant sex differences in coping strategies were found. After controlling for pain intensity, girls used social support seeking more than boys, while boys used more behavioral distraction techniques. Adolescents engaged in more positive self-statements (a cognitive strategy) than children. Both boys and girls showed a trend toward pain coping efficacy being negatively correlated with average pain intensity. For girls, pain coping efficacy was also significantly negatively correlated with internalizing/catastrophizing. However, no sex or age differences in coping efficacy were found. This study demonstrates the early emergence of sex- and aged-based preferences in coping strategies among children and adolescents with chronic pain. The findings establish a basis for further research on early social influences in the development of pain coping styles in males and females. Implications for further clinical research in this area are discussed.

In: *J Pain Symptom Manage* (2007 Feb) 33(2):208-16

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MCBETH J, JONES K

Epidemiology of Chronic Musculoskeletal Pain

The rate of musculoskeletal pain in adolescent and adult populations is examined, with a focus on three commonly reported pain disorders: shoulder pain, low back pain and fibromyalgia/chronic widespread pain. There is a paucity of data on musculoskeletal pain in adolescent populations. Those studies available suggest that pain is common, although the actual rates are unclear. This is probably due to differences in study methodologies and populations. Pain is commonly reported among adult populations, with almost one fifth reporting widespread pain, one third shoulder pain, and up to one half reporting low back pain in a 1-month period. The prevalence of pain varies within specific population subgroups; group factors (including socioeconomic status, ethnicity and race) and individual factors (smoking, diet, and psychological status) are all associated with the reporting of musculoskeletal pain. However, the precise nature of these relationships, and particularly the mechanisms of association, are unclear and require further investigation.

[In: *Best Pract Res Clin Rheumatol* (2007 Jun) 21(3):403-25]

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NEUMANN L, BUSKILA D

Epidemiology of Fibromyalgia

Chronic widespread pain, the cardinal symptom of fibromyalgia (FM), is common in the general population, with comparable prevalence rates of 7.3% to 12.9% across different countries. The prevalence of FM in the general population was reported to range from 0.5% to 5% and up to 15.7% in the clinic. The common association of FM with other rheumatic disorders, chronic viral infections, and systemic illnesses has been well documented in several studies. Up to 65% of patients with systemic lupus erythematosus meet the criteria for FM. FM is considered a member of the family of functional somatic syndromes. These syndromes are very common and share a similar phenomenology, epidemiologic characteristics, high rates of occurrence, a common pathogenesis, and similar management strategies. A high prevalence of FM was demonstrated among relatives of patients with FM and it may be attributed to genetic and environmental factors.

[In: *Curr Pain Headache Rep* (2003 Oct) 7(5):362-8]

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REID GJ, MCGRATH PJ, LANG BA

Parent-Child Interactions among Children with Juvenile Fibromyalgia, Arthritis, and Healthy Controls

Parent-child interactions during pain-inducing exercise tasks among children (11-17 years old) with fibromyalgia, juvenile rheumatoid arthritis, and pain-free controls were examined and the contribution of parent-child interactions to disability was tested. Fifteen children in each of the three diagnostic groups and their parents completed 5-min exercise tasks and completed questionnaire measures of disability (Functional Disability Inventory) and coping (Pain Coping Questionnaire). There were few group differences in parent-child interactions. After controlling for children's ratings of pain evoked by the exercise, group differences in interactions during exercise tasks were no longer significant. Sequential analyses, controlling for group and exercise task, revealed that when parents made statements discouraging coping following children's negative verbalizations about the task or pain, children were less likely to be on task, compared to when parents made statements encouraging coping or when parents made any other statements. Children's general pain coping strategies were not related to parent-child interactions. Parent-child interactions were generally not related to disability.

Across the groups, more pain and less time on task during the exercises were related to Functional Disability Inventory scores and more school absences. Parent-child interaction patterns influence children's adaptation to pain during experimental tasks. Parents' discouragement of coping in response to their children's negative statements related to the pain or the pain-evoking task are counterproductive to children's ability to maintain activity in a mildly painful situation.

[In: *Pain* (2005 Jan) 113(1-2):201-10]

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RICHARDSON JC, ONG BN, SIM J

Experiencing Chronic Widespread Pain in a Family Context: Giving and Receiving Practical and Emotional Support

The impact of pain and chronic illness on the family has been documented, but there is little information about living with chronic widespread pain in the context of the family. This article uses data from a qualitative study of the experience of living with chronic widespread pain to examine the experience and meaning of support for people with this condition in the context of their families. It focuses on the varying, dynamic and reciprocal nature of practical and emotional support in the family. Family members may provide support but are also receivers of support from the person with chronic widespread pain. The factors mediating the provision of this support are also explored, including the nature of the pain and the needs of the person with pain, and the roles, responsibilities and characteristics of other family members.

[In: *Sociol Health Illn* (2007 Apr) 29(3):347-65]

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ROIZENBLATT S, TUFIK S, GOLDENBERG J, PINTO LR, HILARIO MO, FELDMAN D

Juvenile Fibromyalgia: Clinical and Polysomnographic Aspects

OBJECTIVE: To identify the child-mother diagnostic correlation in fibromyalgia (FM), to study sleep disturbance in juvenile FM, and to compare clinical aspects and sleep disorders between these groups.
METHODS: We studied 34 children with confirmed FM aged 11 +/- 1 years, 10 children with diffuse pain, and 17 age and sex matched asymptomatic controls. The respective 61 mothers were included: 34 asymptomatic and 27 with FM. All participants were subjected to clinical evaluation, a sleep questionnaire, and nocturnal polysomnography, preceded by a night of adaptation. Sleep scoring was done visually and a computerized analysis was performed for alpha,

theta, and delta waves in slow wave sleep (SWS). RESULTS: A significant predominance of mothers with FM was observed in the group of children with FM (71%) compared to children with diffuse pain (30%) and asymptomatic children (0%). According to the sleep questionnaire, the complaints of superficial sleep and nonrestorative sleep were more prominent in mothers with FM than in children with FM, whereas motor agitation during sleep was more frequent in the children with FM. Polysomnographic anomalies were also more prominent in mothers with FM than in children with FM in terms of decrease in sleep efficiency, increase of number of arousals during sleep, and alpha intrusion in SWS. Both FM groups presented an increased alpha + theta time/delta time index during SWS compared to respective controls, and mothers with FM also showed an increase in alpha time/delta time index during SWS, compared to asymptomatic mothers. A correlation was found between alpha + theta time/delta time index during SWS and intensity of clinical manifestations of pain and sleep anomalies in children and their mothers. CONCLUSION: Significant concordance was observed regarding FM diagnosis in children and their mothers. Sleep complaints and polysomnography findings were less prominent in affected children compared to mothers with FM. In addition, we observed a significant correlation between polysomnographic indexes, sleep anomalies, and pain manifestations in children and their mothers.

[In: *J Rheumatol* (1997 Mar) 24(3):579-85]

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ROMANO TJ

Fibromyalgia in Children: Diagnosis and Treatment

Fifteen children (16 years and younger, 10 females, 5 males, mean age 13 years) with juvenile primary fibromyalgia syndrome (JPFS) were seen in a private rheumatology practice over two years. This represented 45 percent of the total number of pediatric rheumatology patients. Symptoms included polymyalgias, polyarthralgias, nonrestorative sleep, difficulty concentrating in school and fatigue. Examination revealed typical tender points, absence of joint swelling, synovitis or nodules and absence of neurological findings. Dolorimetry was abnormal and standard laboratory tests were normal. Most of these patients (67 percent) had seen three or more doctors prior to their rheumatological evaluation and not (60 percent) were told they had juvenile chronic arthritis. Other diagnoses offered were "growing pains" (20 percent), hysteria (7 percent) and psychological problems (7 percent). None of the JPFS patients responded to salicylate or other anti-inflammatory medication. Most

(73 percent) responded to cyclobenzaprine, mean dose 12.75 mg. (range 5-25 mg. qhs). JPFS is a very common pediatric rheumatologic problem and is confused with other disorders. Reassurance is very important in the therapy since many parents are fearful that their children may have a potentially crippling disorder. Medication, especially with tricyclics, moderate exercise and proper sleep are also mainstays of therapy.

*Registry Numbers: 303-53-7 (cyclobenzaprine)
50-48-6 (Amitriptyline)*
[In: *W V Med J* (1991 Mar) 87(3):112-4]

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RUSY LM, HARVEY SA, BESTE DJ
Pediatric Fibromyalgia and Dizziness: Evaluation of Vestibular Function

Twelve children with fibromyalgia and complaints of chronic dizziness were evaluated with both clinical office maneuvers of vestibular function and laboratory tests composed of electronystagmography and sinusoidal harmonic acceleration rotary chair testing. All test results were normal for spontaneous nystagmus with or without visual fixation, oculocephalic reflex, dynamic visual acuity, head-shaking nystagmus, Quix test, and Dix-Hallpike maneuver.

Electronystagmography test results were essentially normal for saccades, gaze, Dix-Hallpike, pendular tracking, and caloric evaluation. Rotary chair testing was normal in all 12 patients. These findings suggest that central (brainstem) and peripheral vestibular (inner ear) mechanisms do not account for the complaints of dizziness in the pediatric patient with fibromyalgia. The common musculoskeletal abnormalities of fibromyalgia may affect their proprioceptive orientation, therefore giving them a sense of imbalance.

[In: *J Dev Behav Pediatr* (1999 Aug) 20(4):211-5]

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SIEGEL DM, JANEWAY D, BAUM J
Fibromyalgia Syndrome in Children and Adolescents: Clinical Features at Presentation and Status at Follow-Up

OBJECTIVES: To 1) describe the characteristic features of fibromyalgia syndrome (FS) in a pediatric population, 2) note similarities and differences with FS in adults, and 3) determine

outcome after treatment. **SETTING AND DESIGN:** The Pediatric Rheumatology Clinic at the University of Rochester Medical Center is staffed by two pediatric rheumatologists and serves as a regional subspecialty referral service with approximately 450 annual patient visits, of which approximately 120 are initial evaluations. A retrospective medical record review from 1989 to 1995 was used to identify and describe the study population, and a structured telephone interview served to determine current status and response to treatment. **RESULTS:** A total of 45 subjects were identified (41 female; 42 white; mean age, 13.3 years), of whom 33 were available for telephone interview at a mean of 2.6 years from initial diagnosis (0.1 to 7.6 years). Of a possible 15 symptoms associated with FS, subjects reported a mean of 8, with >90% experiencing diffuse pain and sleep disturbance. Less frequent were headaches (71%), general fatigue (62%), and morning stiffness (53%). The mean cumulative number of tender points summed over all visits was 9.7 (of 18). Telephone interviews showed improvement in most patients, with a mean positive change of 4.8 on a self-rating scale of 1 to 10 comparing current status to worst-ever condition. **CONCLUSIONS:** FS in patients referred to a pediatric rheumatology clinic is characterized by diffuse pain and sleep disturbance, the latter being more common than that in adults. The mean number of tender points summed over all visits is fewer than the criterion of 11 established for adults at a single visit. The majority of patients improved over 2 to 3 years of follow-up.

[In: *Pediatrics* (1998 Mar) 101(3 Pt 1):377-82]

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TAYAG-KIER CE, KEENAN GF, SCALZI LV, SCHULTZ B, ELLIOTT J, ZHAO RH, ARENS R

Sleep and Periodic Limb Movement in Sleep in Juvenile Fibromyalgia

OBJECTIVES: Fibromyalgia has been recently recognized in children and adolescents as juvenile fibromyalgia (JF). In adult fibromyalgia, subjective complaints of nonrestorative sleep and fatigue are supported by altered polysomnographic findings including a primary sleep disorder known as periodic limb movements in sleep (PLMS) in some subjects. Although poor sleep is a diagnostic criterion for JF, few reports in the literature have evaluated specific sleep disturbances. Our objectives were to evaluate in a controlled study the polysomnographic findings of children and adolescents with JF for alterations in sleep architecture as well as possible PLMS not previously noted in this age group. **METHODS:** Sixteen consecutive

children and adolescents (15.0 +/- 2.6 years of age) diagnosed with JF underwent overnight polysomnography. Polysomnography was also performed on 14 controls (14.0 +/- 2.2 years of age) with no history of an underlying medical condition that could impact on sleep architecture. Respiratory variables, sleep stages, and limb movements were measured during sleep in all subjects. RESULTS: JF subjects differed significantly from controls in sleep architecture. JF subjects presented with prolonged sleep latency, shortened total sleep time, decreased sleep efficiency, and increased wakefulness during sleep. In addition, JF subjects exhibited excessive movement activity during sleep. Six of the JF subjects (38%) were noted to have an abnormally elevated PLMS index (>5/hour), indicating PLMS in these subjects. CONCLUSION: Our study demonstrated abnormalities in sleep architecture in children with JF. We also noted PLMS in a significant number of subjects. This has not been reported previously in children with this disorder. We recommend that children who are evaluated for JF undergo polysomnography including PLMS assessment. juvenile fibromyalgia; periodic limb movement in sleep; restless legs syndrome.

[In: *Pediatrics* (2000 Nov) 106(5):E70]

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TSAO JC, MELDRUM M, KIM SC, JACOB MC, ZELTZER LK
Treatment Preferences for CAM in Children with Chronic Pain

CAM [Complementary and alternative] therapies have become increasingly popular in pediatric populations. Yet, little is known about children's preferences for CAM. This study examined treatment preferences in chronic pediatric pain patients offered a choice of CAM therapies for their pain. Participants were 129 children (94 girls) (mean age = 14.5 years +/- 2.4; range = 8-18 years) presenting at a multidisciplinary, tertiary clinic specializing in pediatric chronic pain. Bivariate and multivariate analyses were used to examine the relationships between CAM treatment preferences and patient's sociodemographic and clinical characteristics, as well as their self-reported level of functioning. Over 60% of patients elected to try at least one CAM approach for pain. The most popular CAM therapies were biofeedback, yoga and hypnosis; the least popular were art therapy and energy healing, with craniosacral, acupuncture and massage being intermediate. Patients with a diagnosis of fibromyalgia (80%) were the most likely to try CAM versus those with other pain diagnoses. In multivariate analyses, pain duration emerged as a significant predictor of CAM preferences. For mind-based approaches (i.e. hypnosis, biofeedback and art therapy), pain duration and limitations in family activities were

both significant predictors. When given a choice of CAM therapies, this sample of children with chronic pain, irrespective of pain diagnosis, preferred non-invasive approaches that enhanced relaxation and increased somatic control. Longer duration of pain and greater impairment in functioning, particularly during family activities increased the likelihood that such patients agreed to engage in CAM treatments, especially those that were categorized as mind-based modalities.

In: *Evid Based Complement Alternat Med* (2007 Sep) 4(3):367-74

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YUNUS MB, MASI AT

Juvenile Primary Fibromyalgia Syndrome. A Clinical Study of Thirty-Three Patients and Matched Normal Controls

Primary fibromyalgia syndrome (PFS) is a common and characteristic rheumatologic condition manifested by diffuse musculoskeletal aches, pains, and stiffness frequently modulated by various factors, e.g., weather, physical activity, sleep quality, and anxiety/stress, and accompanied by discrete tender points at typical soft tissue sites. Although well-recognized in adults, this entity has not been reported separately in juveniles. This study documents PFS in 33 juveniles who presented at age 17 or younger and compares their findings with those in age- and sex-matched normal control subjects. As in adult PFS patients, associated non-musculoskeletal symptoms were common, including fatigue, poor sleep, anxiety/stress, headaches, and paresthesias. Physical examination revealed multiple tender points at characteristic soft tissue sites and no objective evidence of arthritis. Routine laboratory test results were normal or negative. Juvenile PFS is often misdiagnosed. Recognition of this common rheumatologic condition in juveniles is important in order to avoid unwarranted investigations and improper management.

[In: *Arthritis Rheum* (1985 Feb) 28(2):138-450]

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YUNUS MB, KHAN MA, RAWLINGS KK, GREEN JR, OLSON JM, SHAH S

Genetic Linkage Analysis of Multicase Families with Fibromyalgia Syndrome

OBJECTIVE: Based on the reports of familial aggregation of fibromyalgia (FM) syndrome, we investigated its possible genetic linkage to HLA by studying multicase families. METHODS: Forty Caucasian multicase families with a diagnosis of FM (American College

of Rheumatology criteria) in 2 or more first degree relatives were investigated. Eighty-five affected and 21 unaffected members of 41 sibships were studied. Depression symptomology was assessed by Zung Self-rating Depression Scale (SDS). HLA typing was performed for A, B, and DRB 1 alleles, and haplotypes were determined with no knowledge of the subject's diagnosis. We investigated genetic linkage to the HLA region by evaluating sibships in multicase families.

RESULTS: Sibship analysis showed significant genetic linkage of FM to the HLA region ($p = 0.028$). Subgroup analysis was also performed for 17 families where the proband was also noted to have depression (with an SDS index value $> \text{ or } = 60$). We found that the presence of depression did not influence the observed results ($p = 0.22$).

CONCLUSION: Our study of 40 multicase families confirms existence of a possible gene for FM that is linked with the HLA region. Our results should be regarded as preliminary and their independent confirmation by other studies is warranted.

[In: *J Rheumatol* (1999 Feb) 26(2):408-12]

[JULY 2008]