Below is a sampling of recent abstracts in CFS/ME and fibromyalgia that we believe are of interest.

Physical and Functional Impact of Chronic Fatigue Syndrome/Myalgic Encephalomyelitis in Childhood
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OBJECTIVE The aim of this study was to compare self-reported and parent-reported quality of life for a group of pediatric patients with chronic fatigue syndrome (CFS)/myalgic encephalomyelitis (ME) and age- and gender-matched healthy control children, to determine the extent of functional and physical impairment.

METHODS The Child Health Questionnaire was completed by 25 children with CFS/ME, who were recruited throughout the United Kingdom, and by 23 age-, gender-, and Tanner scale-matched control children. In addition, patients were asked questions about the background to their illness (ie, precipitating factors), the status of their illness, and school attendance.

RESULTS The median illness duration for patients was 3 years. Sixty-eight percent of the children said that their illness developed quickly, and the illness had an infectious onset for 88%. Only 1 child (4%) attended school full-time, whereas 12 (48%) attended school part-time and 8 (32%) received home tuition only. Children with CFS/ME scored significantly lower for 10 of 14 Child Health Questionnaire concepts; the lowest scores were observed for global health (scores of 21.4 and 84.1 for patients and control subjects, respectively; \( P < .0001 \)) and role/social limitations attributable to physical health problems (scores of 24.9 and 100, respectively; \( P < .0001 \)). Quality of life for the children with CFS/ME compared unfavorably with previously published results for pediatric patients with type 1 diabetes mellitus or asthma.

CONCLUSION The quality of life of children with CFS/ME was profoundly reduced, compared with that of their healthy counterparts.

Orthostatic symptoms predict functional capacity in chronic fatigue syndrome: implications for management
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Objectives: To establish the relationship between the functional impairment experienced by Chronic fatigue syndrome (CFS) patients and the symptoms frequently experienced by those with CFS; specifically cognitive impairment, fatigue and orthostatic symptoms.

Design: Cross sectional questionnaire survey.

Setting: Specialist CFS Clinical Service.

Subjects: Ninety-nine Fukuda diagnosed CFS and 64-matched controls.

Main outcome measures: Symptom and functional assessment tools completed and returned by post included; PROMIS HAQ (Patient-Reported Outcomes Measurement Information System, Health Assessment Questionnaire), CFQ (Cognitive Failures Questionnaire), FIS (Fatigue Impact Scale) and OGS (Orthostatic Grading Scale) assessment tools.

Results: CFS patients experience greater functional impairment than controls [mean (95% CI) PROMIS HAQ scores CFS 36 (31–42) vs. controls 6 (2–10); \( P < 0.0001 \)], especially in the functional domains of activities and reach. Poorer functional ability impairment is significantly associated with greater cognitive impairment (\( P = 0.0002, r = 0.4 \)), fatigue (\( P < 0.0001, r = 0.5 \)) and orthostatic symptoms (\( P < 0.0001, r = 0.6 \)). However, only orthostatic symptoms (OGS) independently associated with functional impairment (\( \beta = 0.4, P = 0.01 \)).

Conclusions: Treatment of orthostatic symptoms in CFS has the potential to improve functional capacity and so improve quality of life.

Impaired cardiovascular response to standing in Chronic Fatigue Syndrome

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KEYWORDS
Cardiac function • diagnosis • fatigue

Background Impaired skeletal muscle metabolism is recognized in chronic fatigue syndrome (CFS). This study examined the relationship between skeletal and cardiac muscle function and symptoms on standing in CFS using magnetic resonance spectroscopy (MRS) and impedance cardiography.

Materials and methods Phosphocreatine (PCr)/adenosine triphosphate (ATP) ratio by cardiac MRS, PCr/ADP and proton efflux by muscle MRS were performed in 12 CFS (Fukuda) and 8 controls. Head up tilt (HUT) and cardiac contractility (left ventricular work index, LVWI) ($n = 64$ CFS and matched controls) were found. Fatigue impact was accessed by Fatigue Impact Scale and orthostatic symptoms by Orthostatic Grading Scale (OGS).

Results Cardiac PCr/ATP correlated with measures of muscle bioenergetic function (half-time PCr recovery $[\kappa = -0.71, P = 0.005]$ and half-time ADP recovery $[\kappa = -0.60, P = 0.02]$) suggesting that the muscle and cardiac bioenergetic function correlate in CFS. Four of 12 (33.3%) CFS patients had PCr/ATP values consistent with significant cardiac impairment. Those with impaired cardiac energy metabolism had significantly reduced maximal and initial proton efflux rates ($P < 0.05$). Cardiac PCr/ATP ratio correlated with myocardial contractility (LVWI) in response to standing ($P = 0.03$). On HUT, LVWI on standing was significantly higher in CFS ($P = 0.05$) with symptoms on standing (OGS) occurring in 61/64 (95%) (vs. 25/64 [39%] controls; $P < 0.0001$). OGS scores were significantly higher in those with abnormal LVWI responses to standing ($P = 0.04$), with the LVWI on standing correlating with OGS scores ($r^2 = 0.1; P = 0.03$). HUT was positive in 19 (32%).

Conclusions Skeletal muscle and cardiac bioenergetic abnormalities associate in CFS. Cardiac bioenergetic metabolism associates with increase in cardiac contractility on standing. Haemodynamic assessment in CFS is well tolerated and safe with a high diagnostic yield comparable with unexplained syncope.

Abnormalities in pH handling by peripheral muscle and potential regulation by the autonomic nervous system in chronic fatigue syndrome

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KEYWORDS
autonomic dysfunction • chronic fatigue syndrome • magnetic resonance spectroscopy • muscle bioenergetics

Objectives. To examine muscle acid handling following exercise in chronic fatigue syndrome (CFS/ME) and the relationship with autonomic dysfunction.

Design. Observational study.

Setting. Regional fatigue service.

Subjects & interventions. Chronic fatigue syndrome (n = 16) and age and sex matched normal controls (n = 8) underwent phosphorus magnetic resonance spectroscopy (MRS) to evaluate pH handling during exercise. Subjects performed plantar flexion at fixed 35% load maximum voluntary contraction. Heart rate variability was performed during 10 min supine rest using digital photoplethysmography as a measure of autonomic function.

Results. Compared to normal controls, the CFS/ME group had significant suppression of proton efflux both immediately postexercise (CFS: 1.1 ± 0.5 mmol L⁻¹ min⁻¹ vs. normal: 3.6 ± 1.5 mmol L⁻¹ min⁻¹, P < 0.001) and maximally (CFS: 2.7 ± 3.4 mmol L⁻¹ min⁻¹ vs. control: 3.8 ± 1.6 mmol L⁻¹ min⁻¹, P < 0.05). Furthermore, the time taken to reach maximum proton efflux was significantly prolonged in patients (CFS: 25.6 ± 36.1 s vs. normal: 3.8 ± 5.2 s, P < 0.05). In controls the rate of maximum proton efflux showed a strong inverse correlation with nadir muscle pH following exercise (r² = 0.6; P < 0.01). In CFS patients, in contrast, this significant normal relationship was lost (r² = 0.003; P = ns). In normal individuals, the maximum proton efflux following exercise were closely correlated with total heart rate variability (r² = 0.7; P = 0.007) this relationship was lost in CFS/ME patients (r² < 0.001; P = ns).

Conclusion. Patients with CFS/ME have abnormalities in recovery of intramuscular pH following standardised exercise degree of which is related to autonomic dysfunction. This study identifies a novel biological abnormality in patients with CFS/ME which is potentially open to modification.

Pain Characteristics of People with Chronic Fatigue Syndrome

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ABSTRACT

Objectives: Until now, there has been a lack of fundamental research into the pain experienced in chronic fatigue syndrome [CFS]. The aims of this study were to (1) investigate the pain experiences of people with CFS with a range of disability, and (2) identify specific pain characteristics of people with CFS.
Methods: Fifty people were recruited, including 10 people who were severely disabled by CFS [25% Group]. Participants completed a structured interview and a series of pain assessments about their current pain, which included the McGill Pain Questionnaire [MPQ], the Pain Anxiety Symptoms Scale [PASS], and visual analog scales.

Results: Muscle pain was the most reported painful symptom [68 percent]. The current pain intensity was 43.2 mm ± 20.8 mm measured on a visual analog scale. The MPQ pain rating index was 23.6 ± 10.8. The PASS total score was 37.9 ± 17.6. Thirty percent [N = 15] of participants reported the cervical spine the location of “most severe” pain, followed by the left and right scapular and right lumbar spine [N = 10 each, 20 percent each]. Further analysis indicated that those people, who were severely disabled by CFS, also experienced significantly more pain [P < 0.05].

Conclusion: The results of this study provide objective data to support anecdotal and clinical reports of pain in people with CFS. Pain in people with CFS should be accepted and treated as seriously as other conditions where pain is a significant symptom. Management strategies need to be tailored to the individual requirements of patients presenting with symptoms of both fatigue and pain.

Unravelling the nature of postexertional malaise in myalgic encephalomyelitis/chronic fatigue syndrome: the role of elastase, complement C4a and interleukin-1β

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KEYWORDS
chronic fatigue syndrome • exercise • fibromyalgia • immunity • pain • postexertional malaise

ABSTRACT
Objectives. Too vigorous exercise or activity increase frequently triggers postexertional malaise in people with myalgic encephalomyelitis/chronic fatigue syndrome (ME/CFS), a primary characteristic evident in up to 95% of people with ME/CFS. The present study aimed at examining whether two different types of exercise results in changes in health status, circulating elastase activity, interleukin (IL)-1β and complement C4a levels.

Design. Comparative experimental design.

Setting. University.

Subjects. Twenty-two women with ME/CFS and 22 healthy sedentary controls Interventions: participants were subjected to a submaximal exercise (day 8) and a self-paced, physiologically limited exercise (day 16). Each bout of exercise was preceded and followed by blood sampling, actigraphy and assessment of their health status.

Results. Both submaximal exercise and self-paced, physiologically limited exercise resulted in postexertional malaise in people with ME/CFS. However, neither exercise bout altered elastase activity, IL-1β or complement C4a split product levels in people with ME/CFS or healthy sedentary control subjects (P > 0.05). Postexercise complement C4a level was identified as a clinically important biomarker for postexertional malaise in people with ME/CFS.

Conclusions. Submaximal exercise as well as self-paced, physiologically limited exercise triggers postexertional malaise in people with ME/CFS, but neither types of exercise alter acute circulating levels of IL-1β, complement C4a split product or elastase activity. Further studying of immune alterations in relation to postexertional malaise in people with ME/CFS using multiple measurement points postexercise is required.

The American College of Rheumatology Preliminary Diagnostic Criteria for Fibromyalgia and Measurement of Symptom Severity

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†ABSTRACT
Objective

To develop simple, practical criteria for clinical diagnosis of fibromyalgia that are suitable for use in primary and specialty care and that do not require a tender point examination, and to provide a severity scale for characteristic fibromyalgia symptoms.

Methods

We performed a multicenter study of 829 previously diagnosed fibromyalgia patients and controls using physician physical and interview examinations, including a widespread pain index (WPI), a measure of the number of painful body regions. Random forest and recursive partitioning analyses were used to guide the development of a case definition of fibromyalgia, to develop criteria, and to construct a symptom severity (SS) scale.

Results

Approximately 25% of fibromyalgia patients did not satisfy the American College of Rheumatology (ACR) 1990 classification criteria at the time of the study. The most important diagnostic variables were WPI and categorical scales for cognitive symptoms, unrefreshed sleep, fatigue, and number of somatic symptoms. The categorical scales were summed to create an SS scale. We combined the SS scale and the WPI to recommend a new case definition of fibromyalgia: (WPI $\geq 7$ AND SS $\geq 5$) OR (WPI 3-6 AND SS $\geq 9$).

Conclusion

This simple clinical case definition of fibromyalgia correctly classifies 88.1% of cases classified by the ACR classification criteria, and does not require a physical or tender point examination. The SS scale enables assessment of fibromyalgia symptom severity in persons with current or previous fibromyalgia, and in those to whom the criteria have not been applied. It will be especially useful in the longitudinal evaluation of patients with marked symptom variability.

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Abstract

BACKGROUND: Chronic Fatigue Syndrome (CFS) studies from our laboratory and others described decreased natural killer cell cytotoxicity (NKCC) and elevated proportion of lymphocytes expressing the activation marker, dipeptidyl peptidase IV (DPPIV) also known as CD26. However, neither these assays nor other laboratory tests are widely accepted for the diagnosis or prognosis of CFS. This study sought to determine if NKCC or DPPIV/CD26 have diagnostic accuracy for CFS.

METHODS/RESULTS: Subjects included female and male CFS cases and healthy controls. NK cell function was measured with a bioassay, using K562 cells and (51)Cr release. Lymphocyte associated DPPIV/CD26 was assayed by qualitative and quantitative flow cytometry. Serum DPPIV/CD26 was measured by ELISA. Analysis by receiver operating characteristic (ROC) curve assessed biomarker potential. Cytotoxic function of NK cells for 176 CFS subjects was significantly lower than in the 230 controls. According to ROC analysis, NKCC was a good predictor of CFS status. There was no significant difference in NK cell counts between cases and controls. Percent CD2+ lymphocytes (T cells and NK cells) positive for DPPIV/C26 was elevated in CFS cases, but there was a decrease in the number of molecules (rMol) of DPPIV/C26 expressed on T cells and NK cells and a decrease in the soluble form of the enzyme in serum. Analyses by ROC curves indicated that all three measurements of DPPIV/CD26 demonstrated potential as biomarkers for CFS. None of the DPPIV/C26 assays were significantly correlated with NKCC.

CONCLUSIONS: By ROC analysis, NKCC and three methods of measuring DPPIV/C26 examined in this study had potential as biomarkers for CFS. Of these, NKCC, %CD2+CD26+ lymphocytes and rMol CD26/CD2+ lymphocyte, required flow cytometry, fresh blood and access to a high complexity laboratory. Soluble DPPIV/C26 in serum is done with a standard ELISA assay, or with other soluble factors in a multiplex type of ELISA. Dipeptidyl peptidase IV on lymphocytes or in serum was not predictive of NKCC suggesting that these should be considered as non-redundant biomarkers. Abnormalities in DPPIV/CD26 and in NK cell function have particular relevance to the possible role of infection in the initiation and/or the persistence of CFS.


A formal analysis of cytokine networks in Chronic Fatigue Syndrome.

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Abstract

Chronic Fatigue Syndrome (CFS) is a complex illness affecting 4 million Americans for which no characteristic lesion has been identified. Instead of searching for a deficiency in any single marker, we propose that CFS is associated with a profound imbalance in the regulation of immune function forcing a departure from standard pre-programmed responses. To identify these imbalances we apply network analysis to the co-expression of 16 cytokines in CFS subjects and healthy controls. Concentrations of IL-1a, 1b, 2, 4, 5, 6, 8, 10, 12, 13, 15, 17 and 23, IFN-gamma, lymphotoxin-alpha (LT-alpha) and TNF-alpha were measured in the plasma of 40 female CFS and 59 case-matched controls. Cytokine co-expression networks were constructed from the pair-wise mutual information (MI) patterns found within each subject group. These networks differed in topology significantly more than expected by chance with the CFS network being more hub-like in design. Analysis of local modularity isolated statistically distinct cytokine communities recognizable as pre-programmed immune functional components. These showed highly attenuated Th1 and Th17 immune responses in CFS. High Th2 marker expression but weak interaction patterns pointed to an established Th2 inflammatory milieu. Similarly, altered associations in CFS provided indirect evidence of diminished NK cell responsiveness to IL-12 and LT-alpha stimulus. These observations are consistent with several processes active in latent viral infection and would not have been uncovered by assessing marker expression alone. Furthermore this analysis identifies key sub-networks such as IL-2:IFN-gamma:TNF-alpha that might be targeted in restoring normal immune function. Copyright © 2010 Elsevier Inc. All rights reserved.

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