

Update on Dr Jonathan Kerr's Research

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By Rowan Hooper

Waking Up To Chronic Fatigue

It affects around one in every 1000 people in the UK, yet it attracts only a fraction of the cash spent on other diseases such as HIV. Once derided as "yuppie flu", the symptoms of chronic fatigue syndrome (CFS), which include cramps, sleeplessness, weakness and headaches, often go unrelieved. That could be about to change as physical evidence for CFS, otherwise known as Myalgic Encephalomyelitis (ME), begins to stack up.

Last week, a meeting in London of CFS specialists heard from Jonathan Kerr of St George's University of London. Kerr and his team used two techniques to look at differences in the expression of 47,000 genes and their variants in people with CFS and a group of unaffected people.

They used a DNA microarray chip to examine gene expression in 27 people with CFS and 54 controls. They also used "massive parallel signature sequencing" to assess gene activity in 20 people with CFS and 20 without by measuring the amount of mRNA each gene produces. The team ended up with about 100 genes where differences in expression between CFS patients and controls were most striking. Last year a pilot study identified 35 faulty genes (New Scientist, 21 July 2005).

Abnormal Immune Genes

"Most of the abnormally expressed genes are involved in the immune system," says Kerr, although he points out that the exact pattern of gene expression varies between sufferers.

Both over and underactive immune expression have been blamed for the symptoms of CFS in the past, but the lack of a single marker has hampered diagnosis. Kerr's work, though preliminary, could herald two breakthroughs: a treatment for the illness based on immune therapy, and a diagnostic test based on a broad spectrum of proteins.

Kerr is in the process of setting up clinical trials using beta interferon, a treatment for multiple sclerosis. It boosts the immune system by enhancing the activity of natural killer cells, which fight viruses. Since viruses are believed to play a role in triggering CFS in many people, beta interferon might clear the infection and help them to shake off CFS.

A test for a disease as misunderstood as CFS would also be invaluable. Kerr's team has developed one that uses mass spectrometry to find proteins that are present in people with CFS but not healthy controls. A pilot study, currently being repeated, shows clear differences between the two groups.

Meanwhile, Raymond Perrin, an osteopath from Manchester, who also attended the meeting, says he has identified other physical manifestations of the disease. Perrin thinks overloading of the lymph ducts can be a factor leading to CFS in some people. Postural problems, damage to the brain from a bang to the head, for example, or chemical or emotional trauma, can place extra stress on the sympathetic nervous system, he says. This can cause the lymph ducts to become overloaded or engorged, contributing to the fatigue and pain suffered by CFS patients. In more than 1000 cases of CFS he has seen, all patients appeared to have problems with their lymphatic glands. "You can't always see the swollen lymph vessels, but you can feel them under the surface of the skin," he says.

Perrin uses soft tissue massage to treat CFS, which encourages lymph to drain back into the bloodstream, and has submitted the results of clinical trials demonstrating the success of the technique to the journal *Clinical Rehabilitation*. "Every little helps," says Kerr. "There is a rationale for why it works. It's non-specific, but manual lymphatic drainage is a good thing."

Other "complementary" techniques may also be helpful, says Basant Puri, a CFS specialist at Hammersmith Hospital, London. In some sufferers, a deficiency of fatty acids such as omega-6 has been implicated in the disease. A poor diet can lead to deficiencies, but crucially, so can viral infection, which can also depress the immune system. Dr Puri says many patients respond well to a combination of the fatty acids EPA and evening primrose oil. "Fatty acid supplements should be available on the National Health Service," he says.

Yet one of the biggest challenges facing those involved in CFS research is that the underlying causes may vary from person to person and one solution is unlikely to fit them all.

What is needed is more funding for further research into the condition, says Ian Gibson MP, who chairs the UK parliamentary group for scientific research into CFS/ME. The group is encouraging people who have had CFS to write in with their stories. "We hope to form a true picture of ME sufferers' hopes and concerns over the current work being undertaken in the treatment and research of ME," says Gibson