

Wetenschap voor Patiënten (Science to patients)

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Webinar 44: Neurocognitive problems in ME

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What are the most common neurocognitive problems in ME?

So the most common neurocognitive problems that we see in the clinic with patients with ME, relate to problems of memory and concentration. About 90% of patients will describe brain fog and problems with memory and concentration. Our studies have shown that when we've taken patients with memory problems, that they have actual abnormalities when we perform neuropsychometric testing. So they have a reduced IQ and particular problems following instructions, so an area called executive function.

What are the causes of these problems? What's the role of the autonomic nervous system here?

In terms of our understanding of these neurocognitive functions, at the moment there's still an awful lot to learn. What we believe here is that the problems with blood pressure regulation that arise because of autonomic dysfunction, may play a part in these neurocognitive problems. We know in patients with autonomic dysfunction who don't have ME that the lower their blood pressure is, the more likely they are to have problems with their memory and concentration and the more their blood pressure drops when they stand up, the more likely their memory is to decline over time.

So our studies that have shown that autonomic dysfunction is very common in ME patients would suggest that autonomic dysfunction may also play a part in the neurocognitive problems that are so commonly seen in this patient group. So the autonomic nervous system probably plays a role in cognitive function by virtue of the fact that it's responsible for control of blood pressure regulation.

So brain perfusion is determined by the autonomic nervous system and if it isn't working properly then your blood pressure, or the head of steam that gets the blood to your brain may not be working properly. And as a consequence you won't get enough blood to your brain, which we believe will make you have a black out at the most extreme end of things, may make you feel a bit dizzy when you stand up in the middle range of things, but in the more subtle end may mean that you have symptoms of light headedness and dizziness or problems with memory and concentration because of lack of perfusion of blood to the brain on a regular basis.

What is the effect of ME on the memory? How is this caused?

Patients with ME tell us that they regularly have problems with their memory. But why that happens isn't really well understood at the moment. What we think is that problems related to blood flow to those areas of the brain that are responsible for memory may lead to the problems that patients with ME describe. So it may be that these problems related to the autonomic nervous system which lead to drops in your blood pressure particularly if patients stand up very quickly might predispose those with ME to the memory problems that are so commonly described.

What is the effect of ME on cognition? How is this caused?

So the effect of ME on cognition is probably via a similar mechanism as the memory. We know that if we drop our blood pressure in patients who have problems with their autonomic nervous system that this is associated with poorer performance on memory tests and that the more the blood pressure drops when we stand up, that this leads to a risk of cognitive decline over time. We know that autonomic dysfunction is a significant problem in patients with ME and it's probably this, that predisposes patients with ME to the cognitive problems that are seen so frequently.

What is the effect of ME on the senses? How is this caused?

Hypersensitivity of the senses in the context of things like hypersensitivity to noises, smell and sounds are very commonly described by patients with ME. It's not really very well understood why that might happen, but again it's possibly that those areas of the brain that are responsible for controlling those particular senses, are overactive or oversensitive. We need to do more research to try and understand why this might be in patients with ME, so that as a result we can understand why it's happening and begin to look at developing specific treatments.

What is the cause of a new type of migraine in ME?

Migraine is very frequently described by patients with ME and it's very interesting whether or not this migraine is a new type of headache in patients with ME. At the moment we have a PhD student here in Newcastle, who is helping us understand migraine a bit better in patients with ME. We're looking at the overlap between migraine and the symptom of fatigue in the migraine neurology clinic and also looking at how common migrainous headaches are in the patients we see in the ME clinic.

Really to help us understand this overlap and whether or not we can develop better treatments. In terms of new types of headache, we're also working very closely with a dentist who is helping us understand a condition called temporomandibular joint dysfunction, which is something that often is misdiagnosed as migraine or headache and is amenable to very specific treatments focused on the joints in the jaw. Hopefully as new information becomes available, we'll be able to understand the relationship between ME and headaches and then lead to better treatments as a result.

What role do hormones play in ME?

At the moment we're doing some research looking at hormones in patients with ME. Our current MRC funded study is looking at an area of the brain called the hypothalamic pituitary axis and this area of the brain is responsible for producing hormones that circulate around the body. We're trying to do experiments that will help us understand how the HPA axis functions and whether or not there are changes in patients with ME. Hormones are a very interesting thing in patients with ME, because patients will often describe to us changes in their symptoms that occur around puberty and around the time of menopause in women. So it really does make you think that hormones may play a part in the symptoms experienced by patients with ME and certainly understanding this complex system more fully will begin to point us in the direction for future studies.

What role do neurotoxines play in ME?

Lots of patients who come to see me in the clinic will describe having been exposed to potentially noxious gasses or vaccines and wonder whether or not neurotoxins might play a role in the symptoms they are experiencing. It's really difficult to answer that question, because at the moment we don't have large scale epidemiological studies to help answer those questions. One recent study that we've performed that is of interest in this context, is one where we've looked at cerebral blood flow and how it associates with the acid that we've been finding in the muscles of patients with ME when we exercise them. And there seems to be a very strong relationship between the abnormalities of peripheral muscle function and the abnormalities that we've found in cerebral blood flow. Suggesting that there may be a relationship between the acid that's accumulated in the periphery that has an impact upon our cognitive function and our cerebral function. So that makes you think that perhaps things in the periphery might have an effect on our brain.

Are viruses and bacteria involved in these neurocognitive problems?

It's interesting to speculate whether or not viruses or other infections might play a role in cognitive problems in patients with ME. Certainly in patients with fatigue associated chronic diseases such as Hepatitis C virus infection, cognitive problems are a real and significant symptom. And we know that viruses in HCV infection replicate in the brain. So it's not unreasonable to speculate that perhaps some of the symptoms that are experienced by patients with ME could in perhaps a proportion of those effected, be related to a past viral infection or current viral infection.