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After a study found omega-3 supplements may ACCELERATE dementia, our columnist reveals

Why I'll still keep taking fish oil pills

Picture: GETTY IMAGES/ISTOCKPHOTO

BEHIND THE HEALTH HEADLINES

by PROFESSOR **ROB GALLOWAY**

THIS week I read a headline that nearly made me choke on my fish-oil pill.

For years I've been taking a daily omega-3 supplement because I don't eat enough oily fish.

This matters – partly because of the possible heart and anti-inflammatory benefits – but for me, mainly because the disease I fear most is dementia and my hope is that omega 3 will help prevent it.

So when I saw the headline about a new study suggesting omega-3 supplements might not protect against dementia but could actually be linked with *faster* decline, I panicked – not just worried about myself, but what I advise others, too.

The research, just published in The Journal of Prevention of Alzheimer's Disease, was based on data from the Alzheimer's Disease Neuroimaging Initiative, a major US dementia study where older adults are being monitored over years with memory checks, brain scans and various blood tests.

The researchers compared 273 people who take omega-3 supplements daily, with 546 similar non-users – and found that those taking fish-oil pills appeared to decline faster on several cognitive scores.

Interestingly, the researchers did not find that this was explained by more amyloid or tau plaques, or brain shrinkage – the classic changes we associate with Alzheimer's.

RATHER, they suggested the link may have been as a result of the brain's poorer ability to use glucose due to oxidative stress. Oxidative stress is, put simply, a form of chemical wear and tear inside the body.

This was the researchers' theory – and it makes sense biologically, as we know that fish oils are delicate fats and if they are old, poor quality, or badly stored, they can become oxidised – and could, in theory, add to the very oxidative stress we are trying to reduce.

So am I worried? The study was observational – where researchers look at what people are already doing, and then search for associations; for example, between using omega 3 and cognitive decline.

This sort of study can be useful because it suggests avenues for further research, but – crucially – it cannot easily prove cause and effect.

The problem is that people who forget names, misplace keys, struggle to find words or have a family history of dementia are understandably more likely to worry about their memory, and may be at higher risk anyway, and want to do something about it. They therefore buy fish oil pills because they've read how good they are for preventing dementia.

The curse of observational nutrition research is that it can make almost anything look good or bad depending on how the research is conducted.

Coffee once looked harmful in observational studies, because coffee drinkers were more likely to smoke.

Which is why, with a frightening headline, I want to know what the randomised controlled trials show.

These are studies where people are randomly assigned to receive either the treatment being tested or a placebo.

And when it comes to omega 3s and cognitive function, in a major review published recently in Scientific Reports, analysis of 58 randomised controlled trials from multiple countries suggested that omega-3 supplements may be associated with slightly *better* cognitive outcomes – or slower decline in some areas, particularly memory.

Although this is a much higher standard of evidence than an observational study, it is by no means perfect.

Not least as it pulled together lots of different studies involving different doses – and very different patients, from healthy adults to people who already had memory problems or dementia.

And many of the studies were short – the real benefit, or harm, of fish oils may only become clear after taking them for years.

The fairest reading of all this is that fish oils are neither magic nor poison, but that they may be somewhat beneficial.

In my view, if people are going to take omega 3s, choose a high-quality supplement (i.e. a known brand and within its use-by date) containing roughly 1,000mg a day of the omega-3 fats EPA (eicosapentaenoic acid) and DHA (docosahexaenoic acid) – these are the main omega-3 fats found in oily fish and are thought to have most of the potential health benefits.

AND remember, omega 3s were never only about dementia anyway.

The strongest evidence for the supplements is in reducing triglycerides, a type of blood fat linked with cardiovascular risk (indeed, people with very high triglyceride levels are often prescribed high doses of omega 3).

There is also evidence of anti-inflammatory effects, which is why some people with arthritis report less stiffness and joint pain taking them.

They may modestly help symptoms in some people with depression, too.

None of this means everyone has to take them. Nor does it mean they undo a bad lifestyle.

And if large, well-conducted randomised trials eventually show omega-3 supplements genuinely accelerate dementia or cause significant harm, I will stop taking them myself.

That is what medicine should be: not blind loyalty to a specific belief or supplement – and not panic about headlines – but following the evidence as it evolves.

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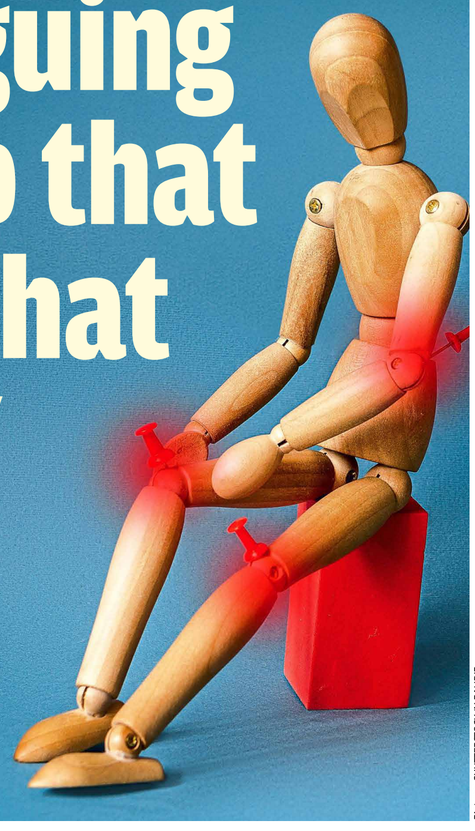
From shoulder pain that's a sign of gallbladder issues, to leg ache linked to your ovaries, an expert guide to referred pain and when to see a doctor...

The intriguing body map that reveals what is REALLY causing your pain



Picture: SHUTTERSTOCK/ALBANDIR

By CARA LEE

WHY does your head hurt when you eat something cold? Is it true that having a heart attack can cause arm pain?

The key to both is referred pain – the sensation of feeling pain in one part of the body, when it's actually caused by a problem in another area entirely.

'Referred pain usually happens because the brain receives "crossed wires" when it perceives pain,' explains Kirsty Bannister, an associate professor in pain neuroscience at Imperial College London and spokesperson for the British Pain Society.

'Pain isn't perceived at the site of injury – the perception of pain is generated in the brain,' she says.

When you experience some kind of injury, nerve fibres carry pain signals from the site to the brain via 30 different points on the spinal cord. 'And it's the level of the spinal cord that the signal comes from that determines where the brain perceives the pain, Professor Bannister. says.

'The problem is multiple different body parts "talk" to the brain via the same particular point on the spinal cord. And the signals can become scrambled, which means the brain can mistake where the injury really is.

'For example, the internal organs will each correspond to a specific spinal cord level, which may also correspond to where input from your arm is mapped on the spinal cord,' explains Professor Bannister.

'The origin of a pain is easy to distinguish if there has been a trauma to the skin, for example, but in the case of referred pain, the brain misinterprets its location – and the area of referred pain may in fact be healthy. In some way, referred pain can save your life – it's telling you something is wrong inside your body that you may not otherwise be aware of,' says Professor Bannister.

But referred pain can also delay the diagnosis, says Dr Aditi Ghei, a pain management consultant at Royal Free London NHS Foundation Trust and the Wellington Hospital in London.

'It can be difficult to find the root of the problem because referred pain is not clear cut,' she says.

Professor Bannister adds that it often originates from our internal organs because they aren't as heavily covered by sensory fibres as our skin. 'This means there aren't as many fibres to detect if something bad happens to an internal organ and send pain signals to the spinal cord,' she says.

But because the brain receives most sensory information from the skin, if nerves from internal organs are activated due to an injury or problem, the brain misinterprets the signal as coming from the skin.

'In many situations, we don't have any idea where the pain is coming from, so doctors should be mindful that it could be referred pain,' says Dr Jan Vollert, a lecturer in pain research at the University of Exeter.

If you have pain for three months or more which can't be explained, 'press for investigations to get to the bottom of what the pain is and where it's coming from', adds Professor Bannister.

Some people are more prone to referred pain than others, including those with diabetes (the condition causes nerve damage) or who've had chemotherapy (which can also harm nerve cells), says Dr Vollert.

'It also gets more frequent as we age because the nervous system becomes less efficient.'

Here, we reveal the telltale signs that you could be experiencing referred pain.

PAIN IN THE HEAD

Could be caused by a problem in: neck, mouth

HEADACHES are a 'classic example of referred pain', says Professor Bannister, and can be caused by nerve compressions in the neck or neck arthritis.

'A pinched nerve or stiff neck can manifest as a headache, because the pain signals radiate and travel up the cervical spine [the area of spine around your neck] to the rest of the head.

'The brain misinterprets pain originating in the neck as a headache, because all head and neck pain signals would travel via the same point on the cervical spinal cord so the brain can get confused.'

Meanwhile, the sensation of 'brain freeze' is, in fact, referred pain from the mouth. This is due to cold receptors in the mouth converging with nerve cells in the cervical spinal cord – 'it's thought that it's not clear to the brain exactly where they've originated, so it causes pain that feels like a headache', says Dr Ghei.

FACE/JAW

Could be a problem in: neck

NERVES from the cervical spine, the jaw and the temporomandibular joint (TMJ, which connects the jaw and skull) feed into the same point on the spinal cord – hence tension in the neck (caused by poor posture, for example) can cause referred pain in the face, jaw or ear, explains Professor Bannister.

'Occasionally, a patient goes to their dentist with mouth or jaw pain, yet has a healthy mouth and teeth,' adds Dr Ghei. This could be referred pain from the TMJ or cervical spine, she says.

EARS

Could be a problem in: teeth, neck

'BECAUSE the ear shares sensory nerve pathways with the jaw and teeth, problems in these areas, such as toothache from gum disease, inflammation or a loose filling, can present as earache despite the ear itself being healthy,' explains Professor Bannister.

Ear pain could also be linked to neck problems (see above).

Dr Ghei adds: 'Further investigation with a specialist may be required in cases of earache if a medical examination has found the ear looks healthy.'

ARM

Could be a problem in: heart

WHILE most people experience a heart attack as severe, crushing chest pain, some feel pain in their left arm.

'This happens because the sensory fibres that surround the heart, and the sensory fibres that carry pain signals from the left arm, meet in the same level of the spinal cord,' explains Professor Bannister.

The point at which nerve signals from the jaw connect to the spinal cord is the same as for the heart, which explains why jaw pain can be another symptom of heart attack, says Dr Ghei.

BACK

Could be a problem in: kidneys, pancreas, womb

SIGNALS from the kidneys meet in the same part of the spinal cord – in the lumbar (or lower) spine – as nerves from the lower back itself. Hence, a kidney infection, for example, can cause pain felt in the lower back.

Kidney stones may also cause lower back pain – these are usually diagnosed with a combination of urine analysis, blood tests and scans.

The way the pain feels in the back can provide clues as to where it's coming from, says Dr Ghei. 'If it's referred pain coming from an organ inside the body, the pain is more likely to be a dull ache, whereas if it's arising from the lumbar spine, it may feel like a sharp or burning pain.'

Problems with the pancreas, such as pancreatitis (inflammation of the pancreas) can result in middle-back pain, says Ivan Ramos-Galvez, a consultant in pain medicine at the Royal Berkshire Hospital in Reading.

This is because the pancreas sits towards the back of the abdomen, and nerve signals from the middle back and pancreas meet on the same level of the spinal cord. Even period pain can be thought of as referred pain, says Professor Bannister.

Signals from the pelvic area travel to the same lumbar spine level as the uterus – and because the uterus is not covered by a lot of sensory nerves, the pelvic pain women can feel as their uterus contracts, shedding its lining, feels very diffused rather than localised, she explains.

For the same reason, pain caused by the uterus contracting can also be felt in the lower back.

However, most of the time, back pain is caused by back problems – only up to 5 per cent of cases would be referred pain, explains Dr Ghei.

What's behind your sore shoulder?

Picture: GETTY IMAGES/ISTOCKPHOTO

COULD BE A PROBLEM IN: gallbladder, liver, lungs, neck

'THE phrenic nerve [which runs from the neck to the diaphragm] passes near the gallbladder and shares the same pathway in terms of input into the spinal cord as the shoulder – so that can generate referred pain,' explains Kirsty Bannister, an associate professor in pain neuroscience at Imperial College London.

This may be due to gallstones or, more rarely, a tumour in the gallbladder – or a liver problem, as this is also connected to the phrenic nerve. Meanwhile, lung infections (such as pneumonia) and lung tumours, can also cause referred pain in the shoulder because the phrenic nerve connects the lungs to the spinal cord.

'That's also why, if you have something like bronchitis [inflammation of the main airways], you can get shoulder pain when you cough,' says Professor Bannister.

If you've experienced persistent shoulder pain for more than three months, see your GP.

UPPER STOMACH

Could be a problem in: spine

IRRITATION, wear and tear or trauma in the facet joints (small joints in the spine) on the vertebrae in the middle of the spine – or in the joints between the vertebrae and the ribs 'can cause pain in the back or upper tummy', says Dr Ramos-Galvez.

As he explains: 'This is because the ribs are moving up and down, and is also due to how the ribs emerge out of the spine at the back, go round the chest wall and finish at the front.

'Another sign is if you press at the back and you feel pain in the front – or just lifting a heavy bag or taking a deep breath end up causing pain in the back, with a pocket of pain in the front of the abdomen,' he adds.

GROIN

Could be a problem in: lower back, hips

PAIN in the groin may, in fact, be due to inflammation – caused by wear and tear – of the sacroiliac joints, which connect the base of the spine to the pelvis, says Dr Ramos-Galvez.

Lower back pain which is exacerbated by sitting down and by walking uphill, or groin pain – especially when sitting – are typical features of this.

Unlike pains originating within the groin (such as muscular strains), referred groin pain from the sacroiliac joint will not cause tenderness or pain when pressure is applied to the groin.

As well as sharing nerve pathways with the sacroiliac joint, the groin communicates with the brain via the same point on the spinal cord as our hips.

This means problems with the hip joint, such as wear and tear of the cartilage – also known as osteoarthritis – can be felt as pain in the front of the groin.

LEGS

Could be a problem in: lower back, ovaries, appendix

SCIATICA – pain caused by irritation or compression of the sciatic nerve, which runs from the lower back to the feet – can cause the feeling of a 'red hot poker' down the back of the leg due to referred pain from the lower spine, says Professor Bannister.

It can happen in one or both legs, depending on the side of the compression.

The exact location of the pain depends on which disc is affected and which nerve root is being compromised, adds Dr Ramos-Galvez, who is also based at the London Pain Clinic.

'For example, pain at the front of the shin or in the feet would be a result of compression at the lower part of the lumbar spine.'

Upper spinal back problems can also cause sciatica, although this is rarer than it being caused by lumbar nerve issues, says Professor Bannister.

'Neck issues such as cord compression (from a tumour or disc herniation) can lead to radiating pain in the legs.'

Upper thigh pain can indicate issues with the ovaries or appendix, explains Dr Ramos-Galvez.

'Inflammation that comes with appendicitis or with an ovarian cyst, for example, will irritate the muscles that go from the spine to the upper thigh.'

There will usually be other signs that point to an abdominal problem, adds Dr Ramos-Galvez, 'for example, feeling pain if the abdomen is pressed'.