Chronic tension-type headache
Chronic-tension type headache: Brain changes in headache
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Chronic tension-type headache is a common chronic pain disorder characterised by a dull, constant feeling of pressure or tightening that usually affects both sides of the head. As the name suggests, headaches occur frequently, at least 15 days per month. Headaches experienced by patients are typically mild to moderate in severity.

Chronic tension-type headache is one of the most common types of headache, along with migraine and medication overuse headache. It is reported that 2-3% of the general adult population suffer with chronic tension-type headache. In addition to headaches, those suffering with chronic tension-type headache often experience chronic fatigue, generalised aches and pains, sleep disturbances, irritability, decreased libido, disturbed memory and concentration and psychiatric problems such as depression and anxiety.

*Causes*

The causes of chronic tension-type headache are not fully known. Initially, it was thought that contraction and tension of muscles in the head and neck was the key trigger, hence its original title: *tension* headache. However, research has revealed that this is not the case and so *tension-type* headache is now the official term.

The current body of research suggests that changes in the pathways that process noxious (painful) stimuli play a role in the development of chronic tension-type headache. Specifically, it is thought that increases in the strength of the connections between nerve cells in these nociceptive pathways cause the transition from acute pain to chronic pain. In some pain conditions, this strengthening of connections leads to non-noxious stimuli being perceived, and processed, as noxious stimuli.

The change in strength of connections between nerve cells is known as *plasticity*. Studies have shown that plasticity occurs in nociceptive pathways in the spinal cord of chronic pain patients. More recently, studies have shown that plasticity also occurs in the brain of chronic pain patients.

*Treatment*

Unfortunately, many patients with chronic tension-type headache do not respond to drug treatments. The knowledge that plasticity occurs in the brain of chronic pain patients might prove useful in understanding the causes of chronic tension-type headache, and could result

in the development of novel treatments that modify the disease, rather than treating the symptoms.

The possibility of non-invasive brain stimulation to treat chronic pain conditions, including chronic tension-type headache is currently under investigation. Non-invasive brain stimulation techniques use magnetic or electrical stimulation to change the excitability state of the brain: current techniques can increase and decrease the excitability state of the brain. At present, the most efficacious approach with non-invasive brain stimulation is to employ repetitive transcranial magnetic stimulation paradigms that increase the excitability state of the brain. It is thought that the stimulation increases the excitability of the brain while reducing the effect of nociceptive cells in the brain. There is evidence of therapeutic benefits from this stimulation paradigm, however, the effects are generally small. Current research aims to characterise plasticity in the brain associated chronic tension-type headache and further develop non-invasive brain stimulation paradigms to provide more efficacious treatment options.