Hypnotic Imagery and Pain.

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Hypnotic imagery is widely used in pain management – particularly for longer-term pain conditions. One approach that I shall return to later is to ask the client in hypnosis to create an image of a 'dial' (or something similar) to represent their current experience of pain. It is then possible to suggest that they use the dial to 'turn the pain down' (or sometimes to turn it up and then down to emphasise self-efficacy). Another effective strategy involves transformation of a self-generated image. One of my own clients, for example, described her chronic neck/shoulder pain as being like the lava in a volcano, welling up, causing pressure etc.. She was able to use hypnotic imagery to move the pain up to the top of her head and allow it to be released – like a volcanic eruption. She was able to reduce her pain from 7 or 8 (on a 10 point scale) to 1 or 2 using this imagery and subsequently to employ it pre-emptively to prevent pain reaching unacceptable levels. When she had used the technique for some time, and had achieved a sense of control over her pain, her image had changed and she described the release of 'lava' as more like a trickle than the violent outpouring it has been at first.

One particular type of chronic pain that is often difficult to treat by traditional means is phantom-limb pain. A little while ago we reviewed 12 single case studies where hypnotic imagery had been used to alleviate this type of pain (Oakley, Gracey-Whitman & Halligan, 2002). We found that the treatment strategies used in these cases were essentially of two types that we labelled as 'ipsative/imagery-based' and 'movement/imagery-based'.

Ipsative imagery is that used by the client in describing their own pain and the intervention consists of transforming that image into something more tolerable or manageable. The 'volcano' imagery described above is one example of ipsative imagery transformation. Another example, from our review paper, is that of a client who experienced one component of her phantom limb pain as being ' like tight rubber bands' around her phantom knee and thigh (Chaves, 1993). She dealt with this in hypnotic imagery by cutting the rubber bands one by one with scissors and as they were released she envisaged them flying across the room. A more recent example comes from one of my own clients who had experienced disabling phantom limb pain ever since her below knee amputation two years previously. She described two major components to the pain in her phantom right leg. The more intense was an intermittent 'bursting, fizzling' pain 'like a firework about to explode' that started low down in her foot and progressed upwards like a 'carpet-knife scraping at the flesh' over her shin bone. The other source of discomfort was a more general background 'tingling' in her phantom limb that made her feel anxious and depressed, disturbed her concentration and disrupted her sleep. For the first of these she developed her own image of taking a jug and 'dousing' the firework by pouring cold water on it and protecting her shin with a thick, soft, cream-coloured 'Iranian rug'. The background tingling was tackled second and responded to the image of replacing the 'tingling leg' with a normal one. These strategies were effective in eliminating the bursting fizzling pain and in reducing the tingling feelings to low manageable levels. These gains were maintained by the client using the same strategies along with her self-hypnosis routine.

In the movement/imagery approaches, hypnotically experienced movements of the phantom limb are used to give the client an experience of voluntary control over the limb and in some cases, more directly, to move the limb into a more comfortable, or less painful, position. This strategy clearly has some similarities to the mirror-box technique for controlling phantom limb pain (Ramachandran & Hirstein, 1998). We have also found that hypnotically induced mirror-box imagery can be effective in removing the experience of phantom limb pain, as can the experience of hypnotically reliving a time before the limb was lost (Oakley & Halligan, 2002). Consistent with these approaches, Willoch et al (2000) reported a series of 8 amputees in which they showed using PET imaging that hypnotically suggested experiences of moving the phantom limb into comfortable or uncomfortable positions were accompanied by corresponding activations in the appropriate cortical motor areas and in brain regions, notably anterior cingulate cortex, associated with the mediation of pain affect. Similarly, an earlier neuroimaging study from the same group used hypnotic suggestions to evoke the subjective experience of tapping movements in the 'fingers' of an amputated arm and described brain activations in contralateral motor cortex similar to those produced by actual finger movements in the remaining hand (Ersland et al., 1996).

We drew three clinical messages from our clinical review and the neuroimaging studies:-

1. Phantom limbs should be regarded for therapeutic purposes as 'real' body parts and the treatment of phantom limb pain should be directed to the phantom itself.

2. The imagery used should be based on the client's own perception of their pain or may involve 'movement' of the missing limb.

3. Hypnotic imagery-based approaches are worthy of further consideration for the treatment of phantom limb pain.

An effective clinical strategy for many chronic pain sufferers is the use of the so-called 'paradoxical injunction', alluded to above, in which the client is first of all invited to 'turn their pain up', rather than down, using an image such as that of a 'pain dial' or 'pain meter'. We have used a similar strategy to explore the functional neuroanatomy of 'functional' pain and the neuromatrix of the baffling chronic pain condition of fibromyalgia. Our first task was to demonstrate that it was possible to create a subjectively compelling experience of pain by purely psychological means without any form of noxious stimulation. We did this successfully in volunteer participants using hypnotic imagery of a powerful heat lamp being turned on above the participant's hand and increasing in intensity until it became painfully hot (Whalley & Oakley, 2003). We then used a similar procedure in an fMRI neuroimaging study to compare in eight hypnotised subjects the brain activity associated with: -

a) experiencing heat pain generated by a heat probe placed on their right hand (physically-induced pain),

b) the experience of a similar pain produced by the suggestion and self-generated imagery of the heat stimulus was being reapplied (hypnotically-induced pain) and

c) the instruction to imagine as clearly as possible the heat pain being reapplied from the same heat probe (imagined pain) (Derbyshire, Whalley, Stenger & Oakley; 2004).

The pain experience created by hypnotic suggestion, in common with the physically-induced pain, produced significant activations in thalamus, anterior cingulate, insula, prefrontal and parietal cortices. Imagined pain in contrast activated very little of the classic pain matrix with minimal activations in insula and S2 (secondary sensory cortex) though participants reported that they were able to imagine the pain clearly. This study demonstrates that a functional pain experience accompanied by brain activations throughout the pain matrix can be produced in the absence of an identifiable physical stimulus and that these functional pain experiences are not simply 'imagined'. Subjective ratings of the pain experience were significantly higher in the physically-induced pain condition (mean 5.7 out of a maximum of 10: range 3-10) than in the hypnotically-induced pain condition (2.8: range 1-9). In both these conditions however, the intensity of brain activations correlated directly with the perceived intensity of the pain experience, with very similar levels of activation at comparable pain intensities in the two conditions. There are clear implications here for the aetiology and treatment of medically-unexplained chronic pain conditions that are functional in nature.

In a subsequent, related fMRI neuroimaging study we used the 'pain-dial' imagery technique to repeatedly modulate the pain experience of a group of thirteen fibromyalgia patients both when they were hypnotised and without hypnosis (Whalley, Oakley, Stenger & Derbyshire, 2004). The participants were able to vary their subjective fibromyalgia pain experience between low, medium and high intensities (within a range of 0-10) to a similar degree under both conditions using the dial imagery. They reported however that they experienced significantly more control over their pain when using the dial imagery in hypnosis and, perhaps related to this, the scans showed much more widespread activations of the pain matrix in the hypnotised condition as pain ratings were increased than in the non-hypnotised condition. Brain correlates of increasing fibromyalgia pain in the hypnosis condition were bilateral cerebellum, thalamus and mid-cingulate, primary and secondary sensory, inferior parietal, insula and prefrontal cortices. This study indicates that the pain of fibromyalgia is mediated via activation of brain areas widely spread throughout the 'normal' pain matrix. It also indicates that the use of imagery to represent and modify the pain experience is effective in not only changing subjective pain reports but also in modulating corresponding brain activity, especially when the imagery is hypnotic. This outcome, taken alongside the results reported by Derbyshire et al (2004) on hypnotically induced pain, is consistent with the possibility that the pain of fibromyalgia is wholly or partially functional in origin. However, as hypnotic imagery and suggestion are well established as means of producing modulation of pain experience in situations where there is a clear physical cause (Hofbauer et al., 2001; Montgomery et al., 2000; Rainville et al., 1997) the present observations on their own do not rule out the possibility of a more peripheral neurological explanation for fibromyalgia pain.

Conclusion.

Hypnotic imagery provides a potentially powerful means of altering pain experience for both experimental and clinical purposes

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