

Behavioural management of migraine

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Abstract

It is important to recognise that migraine is a 'biological' and not a 'psychological' entity. However, psychological factors can be involved in migraine in 4 different ways:- 1) Migraines can be triggered by psychological stressors; 2) Severe migraine can itself be a cause of significant psychological stress which can, in turn, exacerbate the problem; 3) Even if psychological stress is not significantly involved in the genesis of the headache, pain management techniques can help people cope with their pain more effectively; 4) Longitudinal data demonstrate a complex bidirectional association between mood disorders and migraine. Treatment of a co-existing mood disorder, for example with cognitive behavioural techniques, may therefore reduce the impact of migraine. It would thus appear logical to view medical and psychological approaches as potentially synergistic rather than mutually exclusive. Functional imaging indicates that cognition, emotions, and pain experiences change the way the brain processes pain inputs. This may provide a physiological rationale for psychological interventions in pain management. As most studies of psychological management of migraine have been relatively small and the approach often varies between clinicians, the magnitude of benefit, optimum method of delivery, and the length of intervention are uncertain.

Key Words

Cognitive behavioural therapy, migraine, psychological, psychology

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Introduction

It is most accurate, and in medical practice more helpful, to describe headache disorders as primarily 'biological' entities. Pain is real. However, psychological factors frequently co-exist with many headache disorders, and behavioural or cognitive techniques can also be beneficial even if there are no significant psychological problems. For example, it has been recommended that all children with headaches should be routinely offered psychological treatment.^[1]

Physical and psychological medicine might be viewed as two siblings separated at birth. They have acquired different languages and traditions, and are now often viewed as separate and distinct entities. One has become stigmatized. However, when techniques such as functional magnetic resonance imaging (fMRI) demonstrate that both have a physiological

basis, such a dichotomy would seem to be erroneous. In chronic migraine the interaction between 'psychological' and 'physical' factors appears particularly complex.

For those disabled by chronic headache disorders, the most frequently used treatment approach is pharmacotherapy alone. However, for a significant minority there is limited benefit.^[2,3] One reasonable conclusion would be that there is a need for more effective pharmaceutical agents. In addition it must also be acknowledged that there are significant data indicating that psychological strategies (including *behavioural techniques*: relaxation, bio-feedback, implementing lifestyle alterations and routines; *cognitive techniques*: awareness of patterns, observing thinking styles, motivation for change and boosting locus of control; *psycho-education techniques*: understanding the aetiology of headache, triggers, maintenance etc.) can help a large number of sufferers. These treatments are frequently underused. This article explores the evidence for psychological management of migraine and is based round the bio-psycho-social model.

Migraine- a common problem

Primary headache disorders account for 4% of all primary care consultations^[4] and are estimated to cost the UK economy around £2 billion each year.^[5] Migraine affects 18.3% of females and 7.6% of males in England, totalling an estimated 8 million people.^[5] It has a significant impact on quality of life, comparable to that of diabetes or arthritis,^[6] but leads to

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a requested consultation in only 6.4% of females and 2.5% of men.^[7] Despite the reluctance of sufferers to seek consultation, up to 30% of referrals to neurologists are for headaches.^[8] Headache is clearly a common problem and developing a breadth of treatment interventions may prove beneficial, not only to provide choice to headache sufferers but also to support those professionals caring for this group of people.

Interaction between pain perception and psychological factors

The gate control theory (GCT) of pain^[9] suggests that the perception of pain is an integration of peripheral stimuli and cortical variables such as mood and anxiety. Longitudinal data argue that the association between mood disorders and migraine is bidirectional. For example, Breslau and colleagues^[10,11] found that migraine increased the risk of a subsequent episode of major depression but that the presence of major depression also increased the risk of subsequently developing migraine. The existence of such a bi-directional relationship would argue that psychological techniques could have a place in the management of migraine patients, even those without overt psychopathology. This is further supported by findings that the chronic experience of headache itself is a stressor.^[12] Having chronic headache may render the sufferer more susceptible to new headaches. The mechanistic explanation relates in part to theories of central sensitisation, and offers a further rationale for the use of psychological techniques.

The reported efficacy of pharmacological interventions, psychological interventions and combined approaches vary across cohorts but also support a multipronged approach to headache management. The Cochrane Review for Paediatric Headache,^[13] reports efficacy for psychological treatments such as Relaxation and Cognitive-Behavioural Therapy (CBT). The NICE guidelines for Headache, (due out in December 2012) will also be considering non-pharmacological interventions.

Biological rationale for psychological interventions in pain

Functional magnetic resonance imaging (fMRI) is offering an increasing insight into the biological mechanisms involved in primary headaches.^[14-17] Similarly fMRI is also providing biological explanations for the effect of psychological interventions in pain management.

Increasing data support the idea that cognitive and emotional activity, such as hyper vigilance to potential pain and fear of re-injury, can amplify pain perception. For example, in a study using fMRI, researchers demonstrated that distinct areas of the brain are involved in pain processing versus pain anticipation.^[18] More importantly, although the level of brain activation in the regions associated with sensory pain processing remained stable across time, the level of activation in the more cognitive-emotional pain anticipation regions *increased* over time. Thus it appears that cognition, emotions, and pain experiences change the way the brain processes input from pain receptors. For example, techniques such as distraction have been shown to reduce pain. fMRI scans suggest that these techniques work by increasing activation in the affective division of the anterior cingulate cortex and

orbitofrontal regions, while reducing activation in many areas of the pain matrix (thalamus, insula, and cognitive division of the anterior cingulate).^[19] Further support for these techniques is provided by findings taken from real time fMRI in which subjects were found to be able to control activation in the rostral anterior cingulate. When subjects deliberately altered activation in this region there was a corresponding change in the perception of pain caused by an applied painful stimulus.^[20] The ability to regulate the emotional response to aversive situations is also important in minimizing disability. Cognitive reappraisal of highly negative scenes can reduce the adverse experience, and are associated with increased activation of the lateral and medial prefrontal regions and decreased activation of the amygdala and medial orbito-frontal cortex.^[21] This suggests that the prefrontal cortex is involved in constructing reappraisal strategies that can modulate activity in multiple emotion processing systems.

Intriguingly, data from paediatric anxiety disorders also indicate fMRI can predict which patients will respond to behavioural interventions.^[22]

Bio-psycho-social model

First proposed by Engel,^[23] the bio-psychosocial approach reflects the complex relationship between psychological, social and biological factors. A bio-psychosocial approach to migraine management needs to reflect these complex relationships.^[24]

Treating migraine via a single approach, such as pharmacology, can prove beneficial for some, but not for all. Ideally a service should be able to accommodate and adapt to the complexities intrinsic to both the condition and the individual patient.

Most individuals with a migraine related disorder do not have the 'means' to effectively manage their headache.^[25] Increasing the effectiveness of all treatment modalities can be improved if individuals are empowered to manage their symptoms. Psychological techniques can help with this. Factors such as work stress, home stress, relationship difficulties, anxiety, depression and other issues can trigger headaches, maintain them, exacerbate their presentation or add to the disruption of overall functioning above and beyond that experienced from headaches alone. Psychological and behavioural factors might not necessarily play a causal role per se; but instead contribute to headache chronicity.

The bio-psychosocial model is recognizable in most aspects of health. In the field of pain management this has been one driving force underpinning the delivery of services. It is not unreasonable to extrapolate that management of chronic headache would also benefit from such an approach. However, much of the adult pain literature omits headache, although paediatric literature does tend to include headache presentations.^[13]

Psychological and psychiatric comorbidity in chronic migraine

Psychological or even psychiatric disorders frequently co-exist with chronic migraine.

There is a high prevalence of somatic symptoms and depression in patients with disabling chronic headache. Chronic headache

has been found to be associated with major depressive disorder – (OR = 25.1, 95% CI: 10.9 to 57.9), and this relationship appears stronger in those patients with migraine (OR = 31.8, 95% CI: 12.9 to 78.5) [i.e. major depression is thirty times more common in migraine patients than the general population].^[26]

- A large study involving over ten thousand patients identified psychological factors influencing consultation for headache. Consultation was associated with maladaptive coping strategies.^[27]
- Psychological factors associated with poor treatment response include high depression scores, catastrophising and poor coping strategies.^[28]
- Behavioural interventions aimed at modifying coping strategies can improve outcome. This is supported by the guidelines of the Headache Consortium for the management of chronic headache.^[29]

Psychological interventions, such as CBT, could help to manage both headache symptoms and mood disorders. However, certain conditions must be considered prior to engaging in psychological group therapy for headache. A third of patients who receive medical treatment for headache problems discontinue treatment because they are dissatisfied with the care they receive.^[30] This may be due, in part, to co-morbid psychological presentations that are present and which should be addressed prior to headache specific treatments. The literature suggests that it is particularly important to assess the co-morbid presence of mood/anxiety, thought or personality issues in the selection of patients for group treatment.

Psychological interventions

There is an emerging literature providing data to support the design and implementation of psychologically based interventions. Considering the type of headache, medication use history, co-morbid psychological distress and broader systemic issues is regarded as a necessary component of holistic service delivery.

Although data suggests that, in certain circumstances, behavioural and cognitive approaches can be effective viable alternatives to pharmacological measures.^[13,31-36] this does not mean they are mutually exclusive. It is more logical to view both approaches as potentially synergistic. Support for this view comes from a study of 232 individuals through which better outcomes were achieved with a combined pharmacological and behavioural approach.^[37] Arguably, therefore, a gold standard approach would be to include psychological input and/or screening early in treatment, providing a bio-psychosocial hybrid rather than a bio-then-psychosocial approach.

It is important to note that the gains from behavioural approaches have often been reported to be longer lasting in comparison to other treatment options.^[38]

Cognitive techniques have been found to be effective in reducing catastrophising, and produce meaningful improvement in 50% of patients. In patients with high analgesic intake, education and cognitive behavioural therapy significantly improved pain acceptance, functional pain coping and catastrophising. Outcomes included reduced headache severity, and reduced

medication use.^[35] The importance of combining behavioural and educational approaches is further underlined by a study of 100 patients randomized to either an educational course (taught by lay migraineurs) alongside standard management, or offered standard management in isolation. At 6 months the group who received intensive education as well as standard management experienced significantly fewer migraines, less analgesic overuse, were more compliant with prophylactic therapies, and had reduced healthcare utilization (fewer clinic visits).^[39]

Assisting the patient in acquiring new coping skills and modifying their expectations is thought to be central to the success of psychological treatments for migraine. A shift in the locus of control from 'chance' to internal control has been noted as the key contributing factor in someone feeling more able to manage or live with their headache. This was maintained over 12 months of follow-up.^[37]

Method of delivery

Standard behavioural interventions may provide a 40-60% reduction in distress in an average individual with headache^[40,41] but those people with disabling levels of headache require an enhanced treatment package that addresses psychological, social and biological factors.^[40,42,43]

CBT is one of the NICE recommended approaches for managing depression and anxiety.^[44,45] The skills taught in CBT are usually targeted towards managing a specific problem. In headache disorders CBT has been found to prevent mild pain from becoming disabling pain, improving headache-related disability, affective distress, locus of control, quality of life, and reducing over reliance on medication.^[46,47] This effect, in the absence of pain relief, is unique to psychological interventions.

Most studies of psychological management of migraine have been relatively small, and the approach often varies between clinicians. Thus, the optimum method of delivery, and the length of intervention is uncertain. Although psychological therapies may be delivered on a one to one basis, when considering such a common problem such as headache, an individual approach has practical and financial limitations.

Other techniques allow wider application. Various methods have been adopted. Group therapy has been shown to be as efficacious as individual treatment.^[48,49] In other studies psychological intervention even with minimal therapist contact was reported to be as effective as standard psychological interventions^[50] and the use of patient experts has also been explored.^[51] Internet based behavioural regimes have led to significantly greater decreases in headache activity, though with relatively large 'drop out' rates.^[52] They do largely appear acceptable to patients.^[53,54]

Conclusions

It is clear that migraine is a 'biological' and not a 'psychological' entity. However cognitive and emotional activity, such as hyper vigilance to potential pain and fear of re-injury, can amplify pain perception, while psychological factors associated with poor treatment response may include high depression scores,

catastrophising and poor coping strategies. Functional imaging indicates that cognition and pain experience may change the way the brain processes pain inputs. This may provide a physiological rationale for the behavioural/psychological aspects of migraine. It would thus appear logical to view medical and psychological approaches as potentially synergistic rather than mutually exclusive.

Psychological factors can be involved in migraine in 4 different ways. These can inform treatment approaches.

- Stress can be a trigger for migraines. There is evidence that different approaches to coping with stress can reduce the impact of this factor.
- Having severe migraine can itself be a cause of significant stress. This can, in turn make the migraines worse.
- The use of psychological techniques can help people cope with their pain more effectively.
- Longitudinal data demonstrate a complex bidirectional association between mood disorders and migraine. For some patients this can be a significant issue.

Most studies of psychological management of migraine have been relatively small and the approach often varies between clinicians. Thus, definitive evidence of efficacy is not always easy to demonstrate. The optimum method of delivery and the length of intervention are uncertain. While psychological therapies may be delivered on a one to one basis, when considering such a common problem as headache, an individual approach has practical limitations. Some studies have shown group therapy to be as efficacious as individual treatment, while the use of internet based behavioural regimes or patient experts have been advocated by others.

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