Behavioural Management of Headache Triggers: Three Case Examples Illustrating a New Effective Approach (Learning to Cope with Triggers)

Paul R. Martin,¹ Moira Callan,² Archana Kaur² and Karen Gregg²

¹ School of Applied Psychology and Behavioural Basis of Health Research Centre, Griffith University, Brisbane, Queensland, Australia

² School of Psychology and Psychiatry, Monash University, Monash Medical Centre, Melbourne, Victoria, Australia.

The traditional approach to headache trigger management is to advise avoidance of all triggers, but we have advocated an alternative approach called 'Learning to Cope with Triggers' (LCT), in which the objective is to desensitise headache sufferers to some triggers or to build up tolerance for the triggers, using exposure techniques. A recent publication established the efficacy of this approach to trigger management. Reported here are three cases to illustrate how LCT is used in practice. Two cases were male and one was female, with ages ranging from 32 to 67 years. The headache diagnoses were frequent episodic tension-type headache, migraine without aura, and chronic tension-type headache; all had had headaches since childhood/adolescence. The headache triggers that were the focus of the intervention were heat, tiredness, and stress/anger. Post-treatment, changes in the capacity of the triggers to elicit headaches were reported in all three cases. Reductions in headaches from pre- to post-treatment, and from pre- to 4-month follow-up, were: case 1, 69% and 60% respectively; case 2, 76% and 80% respectively; and case 3, 73% and 61% respectively. Decreases in medication consumption, and enhanced self-efficacy were also recorded.

■ **Keywords** migraine, tension-type headache, triggers, sensitisation, desensitisation

It has been estimated that globally, the percentages of the adult population with an active headache disorder are 46% for headache in general, 11% for migraine, 42% for tension-type headache, and 3% for chronic daily headache (Stovner et al., 2007). On the ranking of causes of disability of the World Health Organization (WHO), this brings headache disorders into the 10 most disabling conditions for the two genders, and the 5 most disabling conditions for women (WHO, 2006).

The traditional advice given by clinicians, and in recent years on the internet and smart phone headache/migraine apps, has been that the best way to prevent headaches is to avoid the triggers. For example, one of the 'seven elements of good headache management' listed by WHO is 'identification of predisposing and/or trigger factors and their avoidance through appropriate lifestyle modifications' (WHO, 2006,

Address for correspondence: Paul R. Martin, PhD, School of Applied Psychology, Griffith University, 176 Messines Ridge Road, Mt Gravatt QLD 4122, Australia.

Email: paul.martin@griffith.edu.au

p. 77). We have recently published three reviews arguing against advising avoidance of all headache triggers (Martin, 2010a, 2010b; Martin & MacLeod, 2009). Problems with advising trigger avoidance include: a wide range of factors can trigger headaches (Borkum, 2007; Wöber et al., 2007) and some are not avoidable; and trying to avoid triggers can itself be stressful (Marcus, 2003) and lead to a limited lifestyle (Kelman, 2007). Also, advising trigger avoidance could lead to reduced internal locus of control for headaches, resulting in adverse effects on self-efficacy with respect to one's perceived capacity to cope effectively with triggers (Marlowe, 1998).

We have argued in the reviews that an additional problem may be that avoidance results in sensitisation to the triggers, or reduced tolerance. The argument was developed on the basis of an analogy with anxiety whereby attempts to avoid stimuli that evoke anxiety results in short exposure to these stimuli, which increases their capacity to elicit anxiety (sensitisation), in contrast to prolonged exposure to the stimuli, which decreases their capacity to elicit anxiety (desensitisation; Martin & MacLeod, 2009). In a series of laboratory studies we have demonstrated that short exposure to the headache triggers of visual disturbance, noise and stress leads to sensitisation, whereas prolonged exposure leads to desensitisation (Martin, 2000, 2001; Martin, Lae, & Reece, 2007; Martin, Reece, & Fordyce, 2006).

Evolving from our arguments against trigger avoidance and our laboratory studies, we have developed an alternative approach to trigger management called *Learning to Cope with Triggers* (LCT), which involves exposure to some triggers with the goal of desensitisation or increased tolerance. Of course, some triggers are best avoided as they are not consistent with a healthy lifestyle, such as toxic smells, hunger, dehydration and lack of sleep. We have recently published a randomised controlled trial in which LCT was compared with advice to avoid all triggers, avoidance advice plus cognitive behaviour therapy, and a waiting-list control condition (Martin et al., 2014). The changes in headaches from pre- to post-treatment (minus sign indicates a decrease) for these four conditions were -35.9%, -13.2%, -30.0%, and +11.0%, respectively.

Martin et al. (2014) included information on LCT, such as the principles for identifying triggers and deciding what strategies to use for each trigger, and how to manage the parameters of exposure to triggers (length of exposure and intensity of trigger stimulus) to prevent exposure leading to significant headaches. Presented here are three cases to illustrate how LCT is used in practice, and the effects that can result from it. The cases were selected to show how LCT works with different triggers; specifically, heat, tiredness, and stress/anger.

Method

Each case was treated with eight 60-minute sessions scheduled weekly using LCT. LCT involves the development of Headache Action Plans (HAPs) aimed at managing particular headache triggers, using exposure or avoidance techniques. Relaxation and cognitive training are employed in support of desensitisation. The measures employed were diaries for recording headaches (hourly ratings throughout the waking day on a scale from 0–5) and medication consumption, the Headache-Specific Locus of Control Scale (Martin, Holroyd, & Penzien, 1990) and the Headache Management Self-Efficacy Scale (French et al., 2000).

Case 1

Lee was a 32-year-old university student from Singapore who had experienced headaches since age 4. His headaches met the International Classification of Headache Disorders: 2nd Edition (ICHD-IIR1) criteria for frequent episodic tension-type headache (Headache Classification Subcommittee of the International Headache Society, 2004). Pretreatment, he reported 12 headache days per month, having a peak headache intensity of 4. The pattern of headache symptoms had been stable for over 6 months. He reported triggers that included sudden temperature changes from cold to hot, temperatures greater than 31°C/88°F, and sinusitis. He reported taking headache-related medications, which included one Sudafed (pseudoephedrine; 2 days) tablet and two Paracetamol (1 day) tablets, on three days in the month. Headaches became a significant problem during Year 9 when he became actively engaged in outdoor sports, which involved an increased exposure to heat and glare. His headaches worsened between ages 20–23, when he was conscripted to national army service, which involved living in barracks without air conditioning and spending long periods outdoors. It was decided to work on heat as a key trigger. Lee's exposure goal was to be able to remain in a temperature of 31°C/88°F for a period of 4 hours without triggering a significant headache.

Lee completed a HAP in which he elected to wear an extra top over his usual clothing for an increasing period of time each day, as a way of increasing his body temperature. He adopted this heating technique in preference to the more precise measure of adjusting his heating system's thermostat. He reported being extremely sensitive to increases in his body heat, such that he tended to only wear a light shirt even during cold weather, so preferred a gentler approach to desensitisation.

Lee implemented his HAP, making adjustments based on his response to the exposure technique. His initial plan was to wear a top over his shirt for an increasing amount of time, ranging from 1 to 4 hours each day over the course of 1 week. Having trialled this approach for 3 days, he decided that he could easily tolerate this temperature and so started adding extra layers of clothing to increase his tolerance. No significant headache occurred in response to this challenge.

In his second desensitisation week, Lee added the additional measure of gradually increasing his home's air temperature via the heater's thermostat, in combination with his multiple layers of clothing. By session 6 he was able to tolerate wearing four tops, with the heater set at 23°C/73°F, for a period of 4 hours without setting off a significant headache. In session 7 it was decided that as the treatment sessions were occurring during the winter months, he would maintain his achieved level of heat tolerance until spring, when he would again resume gradually increasing the amount of time he spent outdoors as the air temperature increased, up to his exposure goal of 31°C/88°F for 4 hours.

The percentage decreases at post-treatment and at 4-month follow-up were, respectively: mean daily headache severity, 69%, 60%; and medication consumption, 67%, 67%. Internal locus of control and self-efficacy increased by 42% and -1%, and 37% and 51%, at post-treatment and 4-month follow-up, respectively. Lee no longer listed heat as a trigger of his headaches.

Case 2

Aidan was a 35-year-old professional who was pursuing his MBA after having completed his PhD. He had been suffering from headaches since childhood. His headaches

met the ICHD-IIR1 criteria for migraine without aura. Pretreatment, he reported that he experienced moderate headaches on average 14 days per month. The pattern of headache symptoms had been stable for over 6 months. He reported taking Panadeine Forte (paracetamol and codeine) once a month and Oruvail (ketoprofen) on 12 days each month.

The main triggers identified were tiredness, stress, drinking alcohol and poor posture. Further discussion revealed that stress, alcohol and posture only tended to contribute to a headache when Aidan felt tired prior to the presence of these factors. For example, he reported that he would develop a headache after having alcohol on Friday nights with colleagues following a tiring week at work, but he would not develop a headache if he had the same amount of alcohol at other times. Twelve months previously, his headaches worsened due to greater responsibility at work, resulting in increased tiredness. Aidan had previously been trying to alleviate his headaches through medication, diet or physiotherapy. The medication helped in relieving the pain, but he felt that he continued having headaches as frequently. The other strategies brought limited or no success.

It was decided to work on tiredness as a trigger, and Aidan was taught abdominal breathing. He agreed to undertake an exposure-based approach to increase his tolerance for tiredness, with the goal of getting through his work day without triggering a significant headache. Aidan was also taught progressive muscle relaxation.

A HAP was developed that involved gradually increasing the amount of time spent working before taking a break and ensuring he maintained good posture throughout the day. Specifically, he planned to take a 5-minute break from work every hour for the first day, involving neck stretching, and then going for a walk during his lunch break. In the following days he increased his time at work before taking a break for 15 minutes, until he reached his 2-hour target. He was able to achieve this within 5 days. In addition, if Aidan noticed early warning signs of a headache in the morning before going to work, he planned to take a 10-minute break every half an hour, including abdominal breathing, and to go for a walk during lunchtime. Between sessions 5 and 8, Aidan noticed that due to his HAP, he experienced fewer triggers of headaches because he was indirectly managing his stress levels and posture. Nevertheless, a plan was developed to facilitate good posture, involving adjustments to his work environment.

The percentage decreases at post-treatment and at 4-month follow-up were, respectively: mean daily headache severity, 76%, 80%; and medication consumption 82%, 82%. Internal locus of control and self-efficacy increased by 28% and 15%, and 23% and 9%, at post-treatment and 4-month follow-up, respectively. Aidan reported that although he was taking less medication, the medication seemed more effective when he did take it. He also reported feeling less sensitive to tiredness and other headache triggers.

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Case 3

Maria was a 67-year-old housewife who had a history of headache dating back to age 18. Her headaches met the ICHD-IIR1 criteria for a chronic tension-type headache. At pretreatment assessment she reported waking nearly every day with a headache and going to bed nearly every night with a headache. Maria reported high blood pressure for which she took Karvezide daily. She used Paracetamol for her headaches.

At pretreatment assessment Maria emphasised the precipitating factors of stress and tension. Her stressors included conflict with her husband about the best way to undertake household tasks, the marital status of her children, and her belief that she may never become a grandmother. Relaxation training was commenced in session 1 with instructions in abdominal breathing. At the beginning of session 2, Maria disclosed that she now believed anger rather than stress was her main headache trigger. Maria was asked to complete a list of her common anger-provoking situations for homework. In session 3, Maria identified undertaking household tasks with her husband and son as external provocation events. In addition, her desire to 'do things quickly' was an internal provocation related to her unrealistic timeline expectations. During the session Maria was given cognitive training and asked to monitor her anger-related self-talk for homework. Also, she was provided with reading material about the nature of anger and the anger provocation sequence. In addition, she was asked to construct an anger situations hierarchy, which initially included three situational items with Subjective Units of Distress Scale (SUDS) ratings of 30, 60 and 90.

Session 4 involved an assessment of Maria's anger pattern and the provision of psycho-education about anger (Novaco, 1994). Maria found the identification of her anger-related thoughts difficult, so practice recording these occurred during session 5. This led to a new item in the anger situations hierarchy at SUDS 70, which related to her daughter's behaviour. Education regarding verbal challenging of unhelpful thoughts was provided. In addition, Maria was informed about how to complete the first of her imaginal exposure scenes and asked to complete this as a home activity.

Session 6 commenced with a review of Maria's cognitive restructuring practice. Imaginal exposure practice was undertaken twice in the session for scene 1 (SUDS 30), with satisfactory image vividness and control achieved. Unexpectedly, after completing this activity Maria reported that she now found it difficult to feel as distressed by the scene as she had previously, largely due to discussions related to her cognitive challenging. The development of scenes 2 and 3 were set as homework activities.

Maria commenced session 7 with the disclosure that her GP had found a reduction in her blood pressure in a routine medical check-up. Reductions in her headaches occurred relating to intensity and duration, along with an increase in periods of being headache-free. These were attributed to her feeling less intense emotions. Imaginal exposure practice was undertaken in relation to scene 2 (SUDS 60) and 3 (SUDS 90). A review of Maria's cognitive monitoring in session 8 indicated a depersonalised cognitive response to anger-provoking situations; for example, 'by making it my problem, I only make my emotional feelings worse'. This was followed by instructional self-talk that put a thought between her 'impulse' (anger arousal) and previous 'action' (arguing); for example, 'I thought to myself stop, do the breathing, and just think before you decide what to do.'

The percentage decreases at post-treatment and at 4-month follow-up were, respectively: mean daily headache severity, 73%, 61%; and medication consumption, 11%, 11%. Internal locus of control and self-efficacy increased by 83% and 41%, and 51% and 23%, at post-treatment and 4-month follow-up respectively.

Discussion

Three headache cases for which LCT was used for trigger management have been presented to illustrate how the approach works in practice. Avoidance is an intuitive approach to trigger management, and one that has been embedded in the medical

literature for many decades, so an approach that uses the opposite strategy of exposure needs some elucidation. Of course, the cases do not prove the efficacy of LCT — that was the goal of the RCT (Martin et al., 2014). Nevertheless, large reductions in headaches and medication consumption were recorded in three adults who had been suffering from headaches since childhood/adolescence and who presented with a stable pattern of symptoms, and improvement was maintained at 4-month follow-up.

The reduction in headaches was associated with desensitisation to the triggers but of course, improvement could have resulted from this mechanism or others, such as the changes in locus of control and self-efficacy that occurred, and/or the relaxation and cognitive training. Different mechanisms may have operated for different triggers.

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