

Migraine as a Mental Health Issue

Bradley Bowers

### **Migraine as a Mental Health Issue**

Migraine is a reoccurring condition typified by moderate to severe headaches (Lipton & Silberstein, 2015) and is the third most disabling condition worldwide (Vos et al., 2017). Migraine may occur episodically, chronically (>15 days per month, for 3 months), with sensory disturbances and sensitivity (Aura); and may be precipitated by a prodromal stage of fatigue, food craving and hyper/hypoactivity (Headache Classification Committee of the International Headache Society, 2018). Migraine affects 28% of women and 12% of men in Australia, and is more likely to affect younger and middle aged individuals (Deloitte Access Economics, 2018). Migraine sufferers are five times as likely to develop depression and anxiety, and are more likely to engage in suicidal behaviour (Friedman, Zhong, Gelaye, Williams, & Peterlin, 2018; Stockmeier & Craig, 1997). Furthermore, reduced social functioning and independence may impact upon a migraineur's family and their subsequent mental health (Buse et al., 2016). The total financial burden to Australia including direct (healthcare) and indirect costs (family members healthcare, lost productivity) equates to approximately \$36 billion (Deloitte Access Economics, 2018). Therefore, this policy document will explore options for improving outcomes for migraineurs, their family and the community. This will be done by first highlighting the direct biological, psychological and social factors involved, and their subsequent implications to mental health. Next, the pros and cons of cognitive behaviour therapy (CBT) and pharmacological treatment will be discussed in the context of managing migraines. Finally, recommendations for the provision of services will be discussed.

### **Effects of Migraine**

There is a wide range of literature concerning migraine aetiology which is relevant to mental health. Serotonin (5-HT) is a chemical mediator of nociceptor activation in the brain

(Burstein, Jakubowski, & Rauch, 2011), whereby sustained deficit increases neuronal excitability in the central and peripheral trigeminovascular (TMV) pathways (Gasparini, Smith, & Griffiths, 2017). Diminished 5-HT raises cortical levels of calcitonin gene-related peptide (CGRP), subsequently promoting a release of pro-inflammatory molecules that depolarise sensitive TMV neurons (Aggarwal, Veena, & Sanjeev, 2012). Consequently, waves of neural firing across the cortex is triggered; increasing 5-HT concentration (Sakai, Dobson, Diksic, Aubé, & Hamel, 2008), activating nociceptors and prompting aura (Nosedá & Burstein, 2013). These signals pass through the limbic system for emotional processing before being integrated with thalamic nociceptor projections in the anterior cingulate cortex (ACC) where subjective interpretation of pain is formed (Dahlke, Sable, & Andrasik, 2017). Serotonin levels are returned to their initial state after the attack (Sakai et al., 2008).

These mechanisms are important because they share properties with the pathophysiology of some mental health conditions (Zhang et al., 2017). For example, diminished 5-HT has long been observed in those with depression (Ressler & Nemeroff, 2000). Furthermore, neuroplastic effects of sustained ACC activation from migraine pain have been found to instigate affective dysregulation and altered mood states over time (Lumley et al., 2011). This may result in mood disorders, anticipatory fear and generalised anxiety (Csupak, Sommer, Jacobsohn, & El-Gabalawy, 2018; Lloyd, Helbig, Findlay, Roberts, & Nurmikko, 2016). Thus, migraine may directly (through low 5-HT states) and indirectly (associated chronic pain and ACC activation) increase the odds of developing comorbidities.

Beyond the direct neurological effects, migraine can permeate to social, psychological and occupational aspects of a person's life. Migraine may diminish cognitive abilities such as attention, comprehension, speech and motor skills (Raggi et al., 2014), and limit the

environments migraineurs are able to work and live in due to the associated sensory experiences (Covelli et al., 2018). As a result, migraine can significantly impede quality of life (Raggi et al., 2012) by reducing work opportunities (Blumenfeld et al., 2011), participation and enjoyment of social and family activities (Buse et al., 2016), sleep quality (Sullivan & Martin, 2017) and increased suicidal behaviour (Friedman et al., 2018). Peripheral effects on family members of migraineurs may also impact their own occupational and social functioning, and thus wellbeing (Dueñas, Ojeda, Salazar, Mico, & Failde, 2016). Taken together, these factors have a bi-directional and synergistic effect. At a critical mass, this culminates in a large individual, familial, social and healthcare burden (Deloitte Access Economics, 2018; Vos et al., 2017).

### **Management & Treatment**

Management of migraine should consider individual context, including migraine frequency and severity, goals, previous history and comorbidities (Lipton & Silberstein, 2015). Depending on the patient, non-pharmacological treatments may be employed, such as cognitive behavioural therapy (CBT; Christiansen, Jürgens, & Klinger, 2015). This involves teaching patients how to identify negative cognitions and develop adaptive behavioural coping strategies in response (Peters, Large, & Elkind, 1992). Though widely used, a systematic review by Sullivan et al. (2016) found CBT administered in isolation greatly fluctuates in efficacy (27-67% headache reduction). The authors noted this was mostly due to the differing number of CBT sessions, whereby efficacy was positively associated with more sessions. This is an important consideration when choosing CBT as a treatment, as adherence to CBT requires substantial effort, time and finances to properly implement, and therefore may not be the best choice for the individual or their family. Therefore, a collaborative approach is essential.

Pharmacological intervention is another option in cases where alternatives are non-effective or non-practical. Currently, while there are no approved drugs specifically targeting migraine,  $\beta$ -blockers and tricyclic anti-depressants (TSA) have found to be efficacious (Silberstein, 2010).  $\beta$ -blockers are particularly effective, averaging a 50% reduction in migraine in 60-80% of cases (Holroyd, Penzien, & Cordingley, 1991; Silberstein, 2010). While TSA's are less effective (Silberstein, 2010), they have the added benefit of concurrently acting upon comorbid depression. Other medications such as non-steroidal anti-inflammatory drugs and antileptics may also be used (Lipton & Silberstein, 2015), and there are some promising migraine-specific drugs in development aimed at reducing GCRP (Edvinsson, 2018). Medication also has the advantage of relative convenience in contrast to CBT.

Despite the ostensible benefits of pharmaceuticals, there are several side effects which may further disturb biological or social functioning. These include fatigue, depression, drowsiness, memory disturbance, insomnia, nausea and sexual dysfunction. (Estemalik & Tepper, 2013; Sullivan et al., 2016). Importantly, medication use itself may induce headache and therefore exacerbate rather than relieve symptoms (Lipton & Silberstein, 2015). Therefore, it is recommended to start medication at low dosages, with an evaluation of efficacy, side-effects and comorbidity after two or more months (Estemalik & Tepper, 2013). Overall, the minimalisation of medication where possible is preferred, and the literature suggests a combination of CBT and minor medication use may produce the best outcomes in terms of effectiveness and practicality (Silberstein, 2010).

### **Long-Term Actions & Recommendations**

Increasing accessibility to mental healthcare and support services who can facilitate CBT is a logical first step. Beyond the direct reduction in headaches, improving migraineurs' ability to

cope is a protective factor against depression and anxiety (Christiansen et al., 2015). This in turn enables better management of migraine and improvements to general health which may further mitigate headaches (e.g. better sleep, more exercise, increase socialisation, etc.; Thorn et al., 2007). Increased accessibility has the benefit of facilitating access for family members of migraineurs, and therefore a potential synergistic effect on the social support available (Thorn et al., 2007). This may be accomplished at a state or federal level by increasing the number of subsidised psychology consultations provided under Medicare, provision of migraine specific consultations or reducing the barriers in obtaining a mental health plan. Additionally, increasing funding to tertiary institutions, which are heavily under-resourced and bottlenecked at a postgraduate level for psychology, may improve the availability of CBT (Mathews, Stokes, Crea, & Grenyer, 2010).

On a social level, evidence suggests migraineurs may feel ostracised by a perceived lack of understanding of migraine by employers, peers and the public (Allena et al., 2015). Additionally, almost half of migraineurs go undiagnosed due to misidentifying their symptoms, and misdiagnoses by general practitioners (Katsarava, Mania, Lampl, Herberhold, & Steiner, 2018). Therefore, improving public and medical education may be an effective measure to increase engagement with proper treatment, reduce stigmatisation towards migraineurs, and increase awareness; thus improving social support for migraineurs and their family (Steiner et al., 2011). This may be facilitated by a provision of educational materials or a public health awareness campaign on television, radio or internet advertisement spaces (e.g. YouTube, Spotify, Facebook, etc.). Finally, rapid dissemination and updates to best practice guidelines among medical governing bodies should be completed as soon as possible if migraine specific drugs currently in development were to be approved (Edvinsson, 2018).

In conclusion, migraine is a debilitating condition which constitutes a large individual, familial and societal burden. Biological mechanisms underpinning migraine can impact on an individual's psychological wellbeing, and influence social factors contributing to comorbid mental health conditions. Treatment should involve a combination of CBT and light medication usage, though individual and family context is essential for choosing an ideal treatment solution. Increasing the availability of CBT, and the education to the public and medical professionals regarding migraine is recommended; as increasing coping strategies, reducing stigma and improving mental health of migraineurs and their family may have a multifactorial bearing upon migraine and comorbid conditions.

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