Supporting and Accommodating for the Needs of Migraine Sufferers

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Migraine is an under-recognised, undertreated and debilitating neurological condition affecting 4.9 million Australians (71% being women) (Deloitte Access Economics, 2018). Characterised by recurrent attacks of moderate to severe headache, migraine pain is typically pulsating, causing sufferers to experience nausea, vomiting and sensory sensitivity (Lipton & Silberstein, 2015). Migraine without aura is characterised by specific headache features and symptoms, while migraine with aura is primarily characterized by visual, sensory or other neurological symptoms (ICHD-3, 2013). Migraine is classified as episodic (EM), characterised by 0-14 headache days per month, or chronic (CM), characterised by 15 or more headache days per month (ICHD-3, 2013). CM has been established as an especially disabling and burdensome condition, resulting in greater migraine-related disability and impairment in health-related quality of life (HRQoL) (Blumenfeld et al., 2010). Depression and anxiety are the most common psychiatric comorbidities in migraineurs, contributing to the significantly high rates of suicide attempts within this population (Breslau, Davis, & Andreski, 1991). This is indisputable proof of the distress migraine inflicts on the sufferer and the need to identify and treat mental health comorbidities which significantly predict migraine chronification, adherence to migraine treatment and medication overuse (Minen et al., 2016). Additionally, migraine imposes a significant economic burden on the Australian population ($35.7 billion) and substantial wellbeing costs ($40.0 billion) attributed to pain and suffering incurred by the individual (Deloitte Access Economics, 2018).

Given the high impact on life quality, mental health effects, and substantial financial burden associated with migraine in Australia, there is a clear need for research and services to accommodate for and support the needs of migraine sufferers. This policy will highlight the biological aetiology and psychiatric comorbidities of migraine. Evidence for acute, preventative and behavioural therapy treatments will be discussed. Furthermore, patient

education, adequate provision of services by healthcare professionals, and support for family members will be explored as long-term actions to minimise the impact of migraine and comorbid conditions in Australia.

Effects of Migraine

The pathophysiology of migraine involves the trigeminovascular system activated by inflammatory mediators and agents released during neurogenic inflammation, and cortical spreading depression (CSD) (Moskowitz, 1993). CSD is a propagating wave of depolarization, associated with the aura phase of migraine, giving rise to the activation of meningeal nociceptors, originating in the trigeminovascular pathway (Moskowitz, 1993). This alters the activity of the brainstem, and hypothalamic and limbic structures which integrate signals driving behavioural, affective and autonomic responses (Burstein, Noseda, & Borsook, 2015). The emotional components of migraine symptoms such as dysregulated mood and irritability, as well as the comorbidity between migraine and psychiatric disorders, may be partially explained by the disturbance of these brain structures (Burstein et al., 2015).

The serotonergic (serotonin, 5-HT) system from the brainstem raphe nucleus is also implicated in migraine pathophysiology (Hamel, 2007). A low 5-HT state has been found to activate the trigeminovascular nociceptive pathway, induced by CSD, suggesting that a neurochemical imbalance of 5-HT may form the biological aetiology of migraine (Hamel, 2007). 5-HT dysfunction and dysregulation are central neurobiological mechanisms behind the aetiology of depression and anxiety disorders, possibly explaining the psychiatric comorbidities of migraine (Breslau et al., 1991). Given the involvement of 5-HT in the pathophysiology of migraine, many pharmacological migraine treatments such as triptans and antidepressants discussed below, focus on enhancing and stabilizing 5-HT neurotransmission (Goadsby, Lipton, & Ferrari, 2002).

Migraine has a devastating individual burden, diminishing subjective well-being and HRQoL (Blumenfeld et al., 2011). Often necessitating complete bed rest, migraine attacks interfere with occupational, social and emotional functioning (Lipton & Silberstein, 2015), substantially impacting participation in family life and family relationships (Smith, 1998). Migraineurs report less involvement in their children's lives, missing family and social activities due to migraine, and less communication with children and partners, increasing arguments and interfering with the time they spend together (Lipton et al., 2003). The impacts of migraine extend beyond the sufferer, imposing a heavy burden on children and partners. This suggests that not only those with migraine but also their family would benefit from better provision of services.

Migraine Management & Treatment

The treatment of migraine involves both acute and preventive pharmacological therapies, and non-pharmacological therapies (Dodick & Silberstein, 2007). Acute pharmacotherapy is a symptomatic treatment for migraine attacks and includes nonspecific agents such as aspirin and ibuprofen, and migraine-specific agents (Buse, Rupnow, & Lipton, 2009). Triptans (serotonin 5-HT receptor agonists) are one of the most commonly prescribed migraine-specific agents, relieving migraine pain through cranial vasoconstriction and altered modulation of trigeminovascular nociceptive processing (Goadsby et al., 2002). While effective in treating EM and comorbid depression, triptans have not proven effective for CM patients and have adverse effects. Furthermore, to avoid medication overuse, it is critical to monitor and educate patients on the use of acute medications and prevent anticipatory treatment of migraine (Katsarava, Buse, Manack, & Lipton, 2012).

Calcitonin gene-related peptide (CGRP) targeted drugs are an emerging treatment under review with more favourable side-effects than those of triptans (Edvinsson, 2018).

These were developed in response to recent findings that CGRP enhances nociceptor sensitisation, enhancing pain perception and triggering neurogenic inflammation in the dura (Russo, 2015). While still in phase 3 testing, early clinical results have found the anti-CGRP receptor antibody, erenumab, to significantly reduce migraine frequency in CM patients, improving headache-related disability and HRQoL (Tepper et al., 2019).

Preventive therapy aims to reduce migraine severity and frequency, improving migraine-specific quality of life and enhancing the effectiveness of acute therapies however, preventive therapies are commonly underused (Dodick & Silberstein, 2007). Based on the role of 5-HT in the pathophysiology of migraine discussed above, antidepressants such as tricyclic antidepressants (TCAs) have proven to be effective in the enhancement and stabilization of 5-HT neurotransmission in migraineurs (Hamel, 2007). The efficacy of antidepressants in the prevention of migraine suggests a shared causal mechanism between depression and migraine, however, while effectively treating EM and comorbid depression, these drugs have adverse side-effects and efficacy has not been demonstrated in CM patients (Dodick & Silberstein, 2007). Onabotulinumtoxin A (botox) injections have demonstrated safety and efficacy in CM patients (Diener et al., 2010). Through inhibition of nociceptive mediators, including substance P, CGRP, and glutamate, onabotulinumtoxin A has significantly improved multiple headache symptoms and headache-related disability, significantly improving functional performance and quality of life (Diener et al., 2010).

Non-pharmacological therapies, offered individually or in conjunction with pharmacotherapy, may be involved in migraine management (Buse et al., 2009). Cognitive behavioural therapy (CBT), identifying triggers maintaining headaches, biofeedback, bringing physiologic functions under voluntary control, and relaxation technique training are all cost-effective non-pharmacological strategies without adverse effects (Rains, Penzien, McCrory, & Gray, 2005). Considering the high comorbidity of migraine with depression,

behavioural therapies would be especially appropriate for migraine sufferers (Buse et al., 2009).

Long-Term Actions & Recommendations for Migraine

Regarding the individual, patient education is an effective long-term treatment for migraine and its psychiatric comorbidities. Through the identification and avoidance of triggers, tracking attacks in a headache diary, and awareness of how to maintain a regular, healthy lifestyle, patients are assisted in managing their own condition, reducing migraine pain, improving their quality of life and mental health (Buse et al., 2009). Moreover, behavioural therapy approaches (CBT, biofeedback, and relaxation techniques) previously discussed are also effective long-term strategies for the management of migraine and its psychiatric comorbidities (Rains et al., 2005). Regular practice of stress management and self-care should therefore be encouraged in patient education.

In the long-term management of migraine at a societal level, healthcare professionals must acknowledge what it means to live with migraine and develop a greater understanding of its burden (Rutberg & Öhrling, 2012). Rutberg and Öhrling (2012) explored the experiences of women living with migraine whereby women reported their condition to be invisible to others, often being met with negligence by healthcare providers. Given that many sufferers believe their physicians do not understand the impact of migraine on their lives, and that high-quality care contributes to patient satisfaction, adherence to treatment and improved medical outcomes (Buse et al., 2009), increasing service providers knowledge may be an effective strategy for the long-term provision of services.

Given that the impact of migraine extends to families who serve as caregivers and adjust their schedules to accommodate for the sudden onset of migraine attacks (Lipton et al., 2003), the provision of support services to families is crucial. For effective long-term

management of the migraine burden on families, healthcare professionals should assess the family migraine impact and include family members in discussions, educating and involving them in treatment planning.

Migraine is an under-recognised, debilitating condition, with psychiatric comorbidities including depression and anxiety. Biologically, CSD activation of meningeal nociceptors in the trigeminovascular pathway, disrupts the hypothalamic and limbic system, driving the symptoms of migraine with the negative effects extending to families. Treatment options consist of acute (triptans, CGRP-related) and preventive (TCAs, Onabotulinumtoxin A) pharmacological therapies, and non-pharmacological behavioural therapies. Long-term individual outcomes should focus on patient education and the practice of CBT techniques to manage migraine triggers. The need for increased understanding from healthcare providers and support groups for family members is also recommended.

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