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Review

Clinical impact of migraine for the management of glaucoma patients

Bao N. Nguyen*, Jia Jia Lek, Algis J. Vingrys, Allison M. McKendrick

Department of Optometry and Vision Sciences, The University of Melbourne, Parkville, Victoria, Australia

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ABSTRACT

Migraine is a common and debilitating primary headache disorder that affects 10–15% of the general population, particularly people of working age. Migraine is relevant to providers of clinical eye-care because migraine attacks are associated with a range of visual sensory symptoms, and because of growing evidence that the results of standard tests of visual function necessary for the diagnosis and monitoring of glaucoma (visual fields, electrophysiology, ocular imaging) can be abnormal due to migraine. These abnormalities are measureable in-between migraine events (the interictal period), despite patients being asymptomatic and otherwise healthy. This picture is further complicated by epidemiological data that suggests an increased prevalence of migraine in patients with glaucoma, particularly in patients with normal tension glaucoma. We discuss how migraine, as a co-morbidity, can confound the results and interpretation of clinical tests that form part of contemporary glaucoma evaluation, and provide practical evidence-based recommendations for the clinical testing and management of patients with migraine who attend eye-care settings.

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* Corresponding author. C/O Department of Optometry and Vision Sciences, The University of Melbourne, Victoria, 3010, Australia.
E-mail address: bnguyen@unimelb.edu.au (B.N. Nguyen).

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1. Introduction

Migraine is a common, debilitating primary headache disorder affecting 10–15% of people worldwide, particularly people of working age (Stovner et al., 2007). It is ranked in the top 20 most disabling conditions worldwide (Leonardi and Raggi, 2013; World Health Organisation, 2001), with 90% of migraine sufferers reporting significant impairment to activities of daily living (Lipton et al., 2001a). Attacks of migraine are episodic. The asymptomatic periods in between acute events are known as the interictal period. Typical migraines are characterised by headache, nausea and/or vomiting, sensitivity to light (photophobia) and sound (phonophobia) (International Headache Society, 2013), and are associated with transient sensory symptoms that are predominantly visual. For example, many people experience mild blurring of vision during attacks (Hupp et al., 1989; Vincent et al., 1989), and approximately 30% of migraine sufferers experience a neurological aura as part of their migraine events, with over 90% of these being visual in nature (Kelman, 2004a; Russell and Olesen, 1996).

Given the prevalence of migraine in the general population (Stovner et al., 2007) and the predominance of visual symptoms within this group, clinicians in eyecare settings will regularly encounter patients with migraine. Often patients will seek eye examinations because of the visual symptoms associated with their migraine headaches, and in some cases, may not be aware that their symptoms are consistent with migraine. Approximately 50% of migraine sufferers have never consulted a physician nor received a formal diagnosis of migraine (Cooke and Becker, 2010; Diamond et al., 2007; MacGregor et al., 2003). Moreover, migraine can occasionally be accompanied by permanent neurological changes such as paralysis (previously referred to as 'complicated' migraine). It is therefore imperative that clinicians are able to recognise migraine characteristics, differentiate the danger signs, and consider other more sinister causes of neurological dysfunction, which have been discussed in detail by others (Corbett, 1983; Friedman, 2004; Hupp et al., 1989; Maxner and Moeller, 2005; Shams and Plant, 2011) and are not covered here.

Alternatively, patients may present for routine eye-care for reasons unrelated to their migraines. In these instances, it is likely that they will present during the interictal period, whilst migraine-free and asymptomatic. However, during this period of apparent normality, visual and ocular abnormalities can be detected using standard, clinical tests of vision – namely visual fields, electrophysiology, and ocular imaging. These tests are the very tests used commonly in research and clinical practice for the diagnosis and management of glaucoma. The picture is further complicated by epidemiological data suggesting that migraine is significantly more common (~30%) in patients with glaucoma than in non-glaucoma controls (~10–15%), particularly in patients with normal tension glaucoma (Corbett et al., 1985; Cursiefen et al., 2000; Phelps and Corbett, 1985). Thus, migraine, as a co-morbidity, has the potential to confound the interpretation of clinical test results that form part of contemporary glaucoma assessment. Here, we provide an overview of the currently available technologies and clinical tests for glaucoma evaluation that have been applied to the study of migraine patients, and discuss the challenges in interpreting the test results of patients who suffer from migraines.

2. Definition and diagnosis of migraine

2.1. The International Classification of Headache Disorders

Migraine is diagnosed purely by its symptomatology, as detailed in the International Classification of Headache Disorders (ICHD), which were first published in 1988 and most recently updated in 2013 (International Headache Society, 2013). Previously, migraine was classified using a range of terminology (e.g. 'classic', 'common', 'complicated', 'hemicrania simplex', 'hemiparaesthetic'). The ICHD classifications are the result of a concerted effort to consolidate terminology into a single comprehensive resource and to provide quantitative methods for the diagnosis of headache-related conditions for clinical and research purposes. Therefore, this review will primarily discuss findings of studies that have explicitly classified migraine patients according to these recognised guidelines, where possible (i.e. after 1988).

2.2. Diagnostic criteria for migraine with and without aura

The two most common subtypes of migraine are 'migraine without aura' (MO, Table 1) and 'migraine with aura' (MA, Table 2), affecting 50% and 30% of migraine sufferers, respectively (Rasmussen and Olesen, 1992). The distinguishing factor between MO and MA is the presence of aura, which consists of transient neurological disturbances of sight, speech, or tingling/numbness of the face or body. The majority of migraine auras are associated with headache, known as 'typical aura with migraine headache' (International Headache Society, 2013), which will be referred to herein as the more general term 'migraine with aura'. Less commonly, aura can be associated with migraine headaches that do not fulfil the ICHD diagnostic criteria for MO as listed in Table 1 (known as 'typical aura with non-migraine headache'), or can occur without headache ('typical aura without headache'), which are not discussed here. Similarly, rarer forms of migraine that are excluded from studies of migraine are not discussed in this review (e.g. familial hemiplegic migraine, sporadic hemiplegic migraine, basilar-type migraine), but are described in detail in the ICHD (International Headache Society, 2013).

The symptoms of a migraine attack generally occur in sequential phases (the ictal period), although not all of these phases are present at every episode (Charles, 2013). Up to 48 h before the headache, people may experience prodromal symptoms such as irritability, food cravings, and difficulty concentrating (Becker, 2013; Kelman, 2004b). During attacks of migraine with aura, the neurological disturbances of aura last between 5 and 60 min and subside before the onset of headache (Kelman, 2004a; Rasmussen and Olesen, 1992; Russell and Olesen, 1996); although in some cases, aura symptoms may accompany rather than precede the headache (International Headache Society, 2013). The duration of