

Migraine

Migraine is a common neurological disorder that affects an estimated 12% of the population occurring more frequently in females (18%) than males (6%) (1). The World Health Organisation lists migraine in the top 10 health disabilities and the disorder has a significant impact on well-being and quality of life as well as a substantial economic impact (2).

Diagnosis

The exact causes and mechanisms that underlie migraine have not been easily forthcoming and there are no easily recognizable pathological changes that can be used currently for diagnosis. Diagnosis is therefore presently based on a classification system set by the International Headache Society (3). The two main types of migraine are termed *migraine without aura (MO)*, previously known as common migraine, and *migraine with aura (MA)*, previously termed classical migraine.

MO is characterised by recurrent headache, lasting 4 - 72 hours, with at least two of the following attributes: unilateral location, pulsating quality, moderate to severe intensity and/or aggravation by physical activity. During the headache phase at least one of the following symptoms occur - nausea and/or vomiting, or with photophobia and phonophobia. At least 5 attacks of headache fulfilling these criteria are required to separate this type of migraine from episodic tension-type headache.

MA is characterised by neurological symptoms that usually precede or accompany the migraine headache proper. These symptoms develop over 5 - 20 minutes, and usually last less than 60 minutes. They most commonly include visual disorders, unilateral numbness or weakness, and aphasia or other speech disorders. Headache, nausea, photophobia and/or phonophobia usually follow these symptoms, with headache lasting 4 - 72 hours.

Due to significant symptomatic overlap with various other stroke-like, cerebrovascular and ataxia disorders and a lack of laboratory based diagnostic tests for the common migraine subtypes, the disorder can be difficult to diagnose and determine appropriate treatments.

Epidemiology

The age of onset of migraine is varied. Migraine generally begins at a younger age in men than in women and MA onset is earlier than MO (4). In females, the onset of disorder is usually at, or shortly after puberty. Much less frequently, onset occurs in middle life and occasionally onset begins during menopause. There is significant evidence to indicate that the fluctuating hormones of the ovarian cycle are specific migraine triggers (5, 6), although the precise role of hormones in the pathogenesis of migraine is yet to be established.

Research into migraine has also demonstrated a strong tendency for the disorder to occur in families. In a population-based family study, first-degree relatives of patients with MA had a 3.8- times increased risk of suffering from MA, while first- degree relatives of patients with MO had a 1.9 times increased risk of suffering from MO (7). This strongly indicates a genetic contribution to susceptibility for the disorder. Until recently, the only migraine type for which causative genetic variants had been identified was Familial hemiplegic migraine (FHM), a rare and severe monogenic sub-type of MA. The field of migraine genetics has consequently been dominated by advances in our knowledge about FHM, with the identification and functional characterization of mutations in three different genes involved in cerebral ion translocation (FHM1, FHM2 and FHM3). In contrast, the most prevalent forms MA and MO are largely accepted to be polygenic and consensus on the key genetic contributors is elusive. This is further complicated by a multifactorial mode of inheritance and environmental interactions which create a phenotypic spectrum associated with expression of the disorder.

Co-Morbidity

Migraine has been linked to a variety of diseases, including well defined medical conditions, such as coronary heart disease, stroke, hypertension, diabetes, epilepsy, asthma and depression (8, 9). Epilepsy is closely linked with migraine with a prevalence of 6% in migraineurs compared to 0.5% in non-migraineurs and a recent study suggesting a strong relation between epilepsy and MA (10).

MA is also considered an independent risk factor for stroke in young women (11, 12). In a large prospective study of 27,840 women of age 45 or older MA was associated with increased risk of major CVD, myocardial infarction, ischemic stroke, and death due to ischemic CVD, as well as with coronary revascularization and angina. The association between migraine and ischemic stroke has been observed to be strongest in women under the age of 55 years who are MA sufferers who smoke or use

oral contraceptives. This risk was however not seen in women above 55 years of age. Similarly an association between increased risk for stroke and migraine was only observed in men below the age of 55 years and not in the older population [29]. Migraine has also been closely associated with white matter abnormalities. A population based study demonstrated that clinically silent cerebellar lesions in the white matter were more apparent in MA patients with frequent attacks (13).

Conclusion

Migraine is a complex and common disorder that can present with a variety of symptoms that may differ significantly between sufferers; as well as between episodes in a single individual. Coupled with a lack of lab based diagnostic tests this presents difficulties in obtaining a clear diagnosis. Common migraine is a polygenic multifactorial disorder that is most likely influenced by multiple genes and environmental triggers.

References

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