

Group B: Migraine

What is Migraine?

- A primary headache disorder characterised by recurrent attacks of moderate to severe headache, often with associated neurological features
- Primary means the headache is the disease itself, not a symptom of an underlying condition
- Attacks typically last 4 to 72 hours if untreated and are often disabling
- Migraine with aura affects approximately 25 to 30% of people with migraine; aura involves reversible neurological symptoms before or during the headache
- Chronic migraine is defined as 15 or more headache days per month for 3 or more months
- Etymology: from Old French 'migraine', derived from Greek 'hemikrania' (hemi = half; krania = skull); the name reflects the classic unilateral (one-sided) distribution of migraine pain

Prevalence and Incidence

Global

- Approximately 1.1 billion people live with migraine globally; it is the second most disabling neurological condition worldwide (GBD 2019)
- Migraine is the leading cause of years lived with disability in people aged 15 to 49 worldwide
- Third most prevalent medical condition globally
- Women are 3 times more likely to have migraine than men after puberty; before puberty, the sex distribution is equal

UK

- Approximately 10 million people in the UK live with migraine
- Predominantly affects working-age adults; peak prevalence is in the 25 to 55 year age group
- The UK loses approximately 86 million working days per year due to migraine

Wales

- Wales has higher rates of chronic pain conditions, including migraine, than England; this is likely linked to higher deprivation levels
- Migraine is consistently underdiagnosed and undertreated, particularly in deprived communities with less access to GP and neurology services
- The Welsh Government's chronic pain strategy identifies headache disorders as a priority area

Aetiology

- Multifactorial: genetic predisposition interacting with environmental and physiological triggers
- Genetics plays a significant role: having a parent with migraine roughly doubles the risk, and research has identified many genetic variants linked to the condition
- The brains of people with migraine are more sensitive to stimulation than those without, even between attacks; this is why bright lights or strong smells can be intolerable to some people even when they are not having an attack
- Triggers vary between individuals; common examples include:
 - Hormonal fluctuations: the menstrual cycle is the most common trigger in women and explains much of the female predominance
 - Sleep disruption: too much or too little sleep
 - Stress and the post-stress 'let-down' (the 'weekend migraine' pattern)
 - Dehydration and caffeine withdrawal

- Sensory stimuli: bright lights, strong smells, loud sounds
- Weather and barometric pressure changes
- Triggers do not cause migraine; they lower the threshold in a brain already predisposed to attacks

Pathology

- A migraine attack begins with a wave of altered electrical activity spreading slowly across the surface of the brain; this is what produces the aura in people who experience it
- This wave of brain activity triggers irritation of the nerves surrounding the blood vessels of the brain, which generates pain signals that are interpreted as headache
- The pain is neurological in origin, not vascular; it is the nervous system, not the blood vessels themselves, that drives the attack
- With repeated attacks, the brain can become increasingly sensitive, meaning less provocation is needed to trigger an episode; this is one of the reasons some people progress from occasional to chronic migraine

Signs and Symptoms: The Four Phases

Phase 1: Prodrome (hours to days before headache)

- Mood changes (irritability, depression, or euphoria), food cravings, yawning, fatigue, neck stiffness

Phase 2: Aura (approximately 25 to 30% of attacks)

- Visual aura: the most common type; people see zigzag lines, flashing lights, or areas of lost vision; it typically develops and spreads gradually over 5 to 20 minutes
- Sensory aura: tingling or numbness spreading gradually across the face or hand ('march of symptoms')
- Motor or language aura: weakness in one side of the body or difficulty finding words; rare and should always be investigated to rule out stroke
- Important: aura symptoms spread and develop gradually over minutes; in a stroke or mini-stroke, neurological symptoms appear suddenly and all at once. This distinction matters for safe clinical assessment

Phase 3: Headache (4 to 72 hours untreated)

- One-sided throbbing or pulsing pain, moderate to severe in intensity, made worse by routine physical activity such as climbing stairs
- Nausea and vomiting, sensitivity to light, and sensitivity to sound; many people need to lie down in a dark, quiet room

Phase 4: Postdrome (the 'migraine hangover')

- Fatigue, cognitive slowing, and mood changes lasting 24 to 48 hours after the headache resolves

Risk Factors

Non-modifiable

- **Sex:** female after puberty, with a 3 to 1 female to male ratio driven by oestrogen fluctuations across the menstrual cycle
- **Genetics:** family history is strongly positive in most cases; first-degree relatives of people with migraine have a 2 to 3 times higher risk
- **Age:** peak prevalence from 25 to 55 years; typically reduces after menopause in women

Modifiable

- **Sleep:** irregular sleep patterns are a major trigger; good sleep hygiene is a first-line evidence-based management strategy
- **Stress management:** psychological approaches including CBT and mindfulness reduce attack frequency
- **Dietary triggers:** highly individual; keeping a headache diary to identify personal triggers is recommended
- **Analgesic overuse:** using acute pain medication (including paracetamol, ibuprofen, or triptans) on more than 10 to 15 days per month can transform episodic migraine into chronic daily headache; this is called analgesic overuse headache or medication overuse headache
- **Physical activity:** regular moderate aerobic exercise has a preventive effect on migraine frequency

Quality of Life

Migraine causes more lost healthy years of life in people aged 15 to 49 than MS, Parkinson's disease, and epilepsy combined (GBD 2019); it is the world's leading cause of disability in working-age adults

- **Physical:** attacks render most people unable to function for hours to days
- **Employment:** the UK loses approximately 86 million working days per year to migraine
- **Psychological:** depression and anxiety are significantly more common in people with migraine compared with the general population; the relationship is bidirectional
- **Predictability:** the unpredictable nature of attacks drives anticipatory anxiety, avoidance behaviour, and social withdrawal
- **Chronic migraine (15 or more days per month):** severe quality of life impairment comparable to congestive heart failure and other major chronic conditions
- **Stigma:** migraine is frequently trivialised as 'just a headache', leading to underdiagnosis and undertreatment; this pattern disproportionately affects women patients

Exercise is a first-line preventive recommendation; regular moderate aerobic activity reduces attack frequency in the majority of people with episodic migraine

Sources

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