Burden of Illness
PATIENT BURDEN OF MIGRAINE
Impact of Migraine
Impact of Migraine

• Migraine accounts for 1.3% of years lost to disability

• Burden on sufferers
  • Personal suffering
  • Impaired quality of life
  • Financial cost
  • Constant fear of another headache
  • Damage family and social life and employment

Depression is three times more common in people who suffer migraines or severe headaches than in healthy individuals

Impact of Migraine

• About 50% of migraine sufferers are severely disabled or require bed rest
• Some disability is due to comorbid conditions
• Financial cost of headache arises partly from direct treatment costs, but much more from loss of work time and productivity
• Annual U.S. direct medical costs attributable to migraine were estimated at $1 billion in 1999
• In 2004, the total cost of migraine in the EC (15 countries) was estimated at €25 billion per year, the next-highest after dementia among neurological disorders

Migraine reduces health-related quality of life more than osteoarthritis or diabetes
Migraine Patients Experience Severe Pain and Disability

Pain
- Extremely severe: 33%
- Severe: 47%
- Moderate: 18%
- Mild: 1%

Disability
- Severe impairment/Bed rest: 53%
- Some impairment: 38%
- Normal function: 9%
Impact of Migraine on Patient’s Daily Lives

- Unable to do chores/household work: 76%
- Household work productivity reduced by ≥50%: 67%
- Missed family/social/leisure activity: 59%
- Work/school productivity reduced by ≥50%: 51%

Figure. Prevalence (in percentage) of somatic symptoms in women by headache frequency and headache-related disability. *p < 0.05; **p < 0.01; ***p < 0.001.
# Impact of Chronic Migraine on Daily Activities over a 3-Month Period

<table>
<thead>
<tr>
<th></th>
<th>CM</th>
<th>Migraine</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N (%)</td>
<td>N (%)</td>
<td></td>
</tr>
<tr>
<td><strong>Days of missed work or school</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Complete responses</td>
<td>436</td>
<td>8768</td>
<td>P = .0012</td>
</tr>
<tr>
<td>None</td>
<td>329 (75.5)</td>
<td>6935 (79.1)</td>
<td></td>
</tr>
<tr>
<td>1-4 days</td>
<td>65 (14.9)</td>
<td>1304 (14.9)</td>
<td></td>
</tr>
<tr>
<td>5 or more</td>
<td>36 (8.2)</td>
<td>232 (2.2)</td>
<td></td>
</tr>
<tr>
<td><strong>Days with reduced productivity at work or school</strong></td>
<td></td>
<td></td>
<td>P &lt; .001</td>
</tr>
<tr>
<td>Complete responses</td>
<td>432</td>
<td>8542</td>
<td></td>
</tr>
<tr>
<td>None</td>
<td>214 (49.5)</td>
<td>4495 (52.6)</td>
<td></td>
</tr>
<tr>
<td>1-4 days</td>
<td>25 (5.8)</td>
<td>2158 (25.3)</td>
<td></td>
</tr>
<tr>
<td>5 or more</td>
<td>146 (33.8)</td>
<td>1051 (12.3)</td>
<td></td>
</tr>
<tr>
<td><strong>Household work</strong></td>
<td></td>
<td></td>
<td>P &lt; .001</td>
</tr>
<tr>
<td>Complete responses</td>
<td>493</td>
<td>9124</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>98 (19.9)</td>
<td>2479 (27.2)</td>
<td></td>
</tr>
<tr>
<td>1-4 days</td>
<td>47 (9.5)</td>
<td>3305 (36.2)</td>
<td></td>
</tr>
<tr>
<td>5 or more</td>
<td>283 (57.4)</td>
<td>2219 (24.3)</td>
<td></td>
</tr>
<tr>
<td><strong>Days with reduced productivity at work</strong></td>
<td></td>
<td></td>
<td>P &lt; .001</td>
</tr>
<tr>
<td>Complete responses</td>
<td>482</td>
<td>8798</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>99 (20.5)</td>
<td>3060 (34.8)</td>
<td></td>
</tr>
<tr>
<td>1-4 days</td>
<td>27 (5.6)</td>
<td>2908 (33.1)</td>
<td></td>
</tr>
<tr>
<td>5 or more</td>
<td>280 (58.1)</td>
<td>1602 (18.2)</td>
<td></td>
</tr>
<tr>
<td><strong>Days missed family activities</strong></td>
<td></td>
<td></td>
<td>P &lt; .001</td>
</tr>
<tr>
<td>Complete responses</td>
<td>490</td>
<td>9135</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>139 (28.4)</td>
<td>4036 (44.2)</td>
<td></td>
</tr>
<tr>
<td>1-4 days</td>
<td>87 (17.8)</td>
<td>2816 (30.8)</td>
<td></td>
</tr>
<tr>
<td>5 or more</td>
<td>181 (36.9)</td>
<td>868 (9.5)</td>
<td></td>
</tr>
</tbody>
</table>

Comparison with episodic migraine.\(^5\)

CM = chronic migraine.

Social and Economic Burden of Headache Disorders

• Large amount of disability and financial costs to society
• Most troublesome during people’s productive years
• 25 million working/school days lost annually in the UK due to migraine
  • Cost is matched by tension-type headache and chronic daily headache combined
  1
• Many do not receive effective care
  • Only 50% of those with migraine consult a physician
  • Only two-thirds are correctly diagnosed

Psychosocial Burden of Migraine

- Problems are commonly reported with:
  - Energy and drive function
  - Emotional functions
  - Sensation of pain
  - Remunerative employment
  - General evaluations of mental and physical health
  - Social function
  - Global disability evaluations

Symptomatic and prophylactic treatments can reduce patient difficulties and the associated burden of migraine

Comorbidities of Migraine
Comorbidities of Migraine

- Strong association with
  - Anxiety and mood disorders
  - Allergies
  - Chronic pain disorders
  - Epilepsy

- Migraine with aura is a risk factor for ischemic stroke and silent brain lesions on MRI, particularly in women with frequent attacks
Prevalence of Anxiety and Depression in Patients with Migraine*

Approximately 1/3 of migraine sufferers with anxiety had depression
Approximately 2/3 of migraine sufferers with depression had anxiety

*Numbers of patients
Anxiety and Depression Influence Frequency of Migraine Attacks

Combination of anxiety and depression increases headache frequency
Anxiety increases headache intensity

<table>
<thead>
<tr>
<th></th>
<th>Migraine subjects without anxiety or depression, N = 93 Median (25% -75%)</th>
<th>Migraine subjects with anxiety alone, N = 28 median (25% -75%)</th>
<th>Migraine subjects with depression alone, N = 9 median (25% -75%)</th>
<th>Migraine subjects with anxiety and depression, N = 17 median (25% -75%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency per month</td>
<td>1.0 (0.3-3.0)</td>
<td>2.0 (1.0-5.0)</td>
<td>1.0 (0.3-4.0)</td>
<td>8.0 (2.5-21.0)</td>
</tr>
<tr>
<td>VAS score for pain intensity</td>
<td>6.0 (5.0-7.0)</td>
<td>7.0 (6.0-8.0)</td>
<td>7.0 (6.0-8.0)</td>
<td>7.0 (5.0-9.0)</td>
</tr>
<tr>
<td>HIT-6 score</td>
<td>50.0 (46.0-58.0)</td>
<td>57.0 (49.0-60.8)</td>
<td>62.0 (52.0-70.5)</td>
<td>64.0 (61.0-67.0)</td>
</tr>
</tbody>
</table>


Anxiety and Depression Influence Migraine-Induced Disability

Anxiety and depression should be systematically looked for and cared for in patients with migraine.

MIDAS = Migraine-related Disability
Migraine and Depression

• Migraine associated with depression, anxiety, phobias, and panic disorders
• Migraine with aura: higher lifetime prevalence of major depressive disorder than patients with migraine without aura
• Possible mechanisms:
  • Psychiatric disorders and migraine are associated as a result of chance
  • Migraine is a causal factor in the development of psychiatric conditions or vice versa – or both
  • Shared environmental risks for depression and migraine may exist
  • A common shared etiological factor may explain the coexistence of depression and migraine
Migraine and Depression: A Bidirectional Relationship with Common Neurobiology

- Monoamine and peptide transmitters may be involved in depression
- Endorphins and encephalins are involved in mood and pain control
- Serotonin has been implicated in migraine, and tension-type headache
  - Also implicated in mood disorders, anxiety disorders, sleep disorders, eating disorders, and obsessive-compulsive behavior
- Evidence suggests dopamine is involved in migraine
  - Migraine prodrome often characterised by dopaminergic symptoms
  - Anti-dopaminergic drugs can often be helpful in treating migraine

Severe headache, severe somatic symptoms, and major depression may be linked through dysfunction of the serotonergic and dopaminergic systems

Migraine, Depression, and Quality of Life

- Depression or anxiety are not determined by migraine intensity
  - Significant association between **migraine frequency** and depression
  - Significant association between depression and **duration of migraine attacks**
- Migraine and depression significantly decrease HRQoL
- Patients with migraine may have a lower HRQoL even after controlling for depression
  - More frequent attacks = poorer quality of life

**HRQoL** = health-related quality of life
Effect of Migraine on Sleep Quality

- PSQI score total score highest in patients with frequent migraine and lowest in controls
- ↓ sleep quality is due to migraine; cannot be explained exclusively by comorbid depression or anxiety

Table 2: Fatigue assessed by means of the Fatigue Severity Scale in patients with migraine and migraine-free controls

<table>
<thead>
<tr>
<th>Patients with</th>
<th>≥8 migraine days</th>
<th>5–7 migraine days</th>
<th>1–4 migraine days</th>
<th>Controls</th>
<th>Prevalence (%)</th>
<th>Prevalence (%)</th>
<th>Prevalence (%)</th>
<th>Prevalence (%)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDS ≥ 40</td>
<td>40.2</td>
<td>32.0</td>
<td>24.4</td>
<td>16.3</td>
<td>16.3</td>
<td>24.4</td>
<td>24.9</td>
<td>16.3</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>SAS ≥ 40</td>
<td>30.9</td>
<td>30.7</td>
<td>24.9</td>
<td>6.7</td>
<td>6.7</td>
<td>24.9</td>
<td>6.7</td>
<td>6.7</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>SDS and/or SAS ≥ 40</td>
<td>46.4</td>
<td>44.2</td>
<td>33.3</td>
<td>16.3</td>
<td>16.3</td>
<td>33.3</td>
<td>16.3</td>
<td>16.3</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mean</th>
<th>S.D.</th>
<th>Mean</th>
<th>S.D.</th>
<th>Mean</th>
<th>S.D.</th>
<th>Mean</th>
<th>S.D.</th>
<th>Mean</th>
<th>S.D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDS</td>
<td>37.3</td>
<td>8.7</td>
<td>35.8</td>
<td>8.8</td>
<td>34.4</td>
<td>8.5</td>
<td>32.0</td>
<td>7.1</td>
<td>&lt; 0.001</td>
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<tr>
<td>SAS</td>
<td>36.5</td>
<td>7.6</td>
<td>36.8</td>
<td>7.6</td>
<td>34.8</td>
<td>7.4</td>
<td>28.4</td>
<td>6.1</td>
<td>&lt; 0.001</td>
</tr>
</tbody>
</table>

SDS, Self-rating Depression Scale; SAS, Self-rating Anxiety Scale.

Prevalence of depression and/or anxiety and SDS and SAS scores decreased significantly from patients with ≥8 migraine days/month. Fatigue and daytime sleepiness did not differ between migraine sufferers and control subjects.
Migraine and Other Comorbidities

- Low back pain
- Allergies
- Irritable bowel syndrome
- Fibromyalgia

Migraine and Obesity

Obesity increases migraine frequency

<table>
<thead>
<tr>
<th>Body Weight</th>
<th>Risk of CM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>3%</td>
</tr>
<tr>
<td>Overweight</td>
<td>9%</td>
</tr>
<tr>
<td>Obese</td>
<td>15%</td>
</tr>
</tbody>
</table>

Migraine and Vascular Disease

- Migraine associated with increased cardiovascular or cerebrovascular disease
- Migraine with aura increases risk of myocardial infarction and ischemic stroke
  - Migraine without aura raises both risks by approximately 25%
  - Migraines during pregnancy linked to stroke and vascular diseases
  - Migraine with aura for women in midlife associated with late-life vascular disease (infarcts) in the cerebellum
- Male and female migraine sufferers have a 2.5-fold increased risk of subclinical cerebellar stroke
  - Aura + increased headache frequency = highest risk
- Migraine associated with higher incidence of adverse cardiovascular profiles, including diabetes and hypertension

Medication Overuse Headache (MOH)

- New or worsening of existing headache develops in association with medication overuse
- Headache on ≥15 days/month for >3 months due to overuse of acute medications
  - About 50% of people have MOH
- Most patients improve after withdrawal of the overused medication

If Migraine Is NOT Treated Effectively...

- It may cause severe suffering, loss of quality of life, loss of productivity, have economic considerations
- Patient may develop chronic migraine or medication overuse headache


