BURDEN OF ILLNESS
Overview
Impact of Chronic Pain

Burden of Illness of Fibromyalgia

- An estimated 75% of people with fibromyalgia remain **undiagnosed**
- Imposes large economic burdens on society
- Significant adverse effects of patients’ quality of life

Physical Burden
Patient-Reported Impact of Fibromyalgia

Overall quality of life: Latin America 84, Europe 76
Personal relationships: Latin America 70, Europe 66
Ability to keep appointments: Latin America 66, Europe 47
Ability to participate in hobbies: Latin America 70, Europe 54
Ability to care for family: Latin America 67, Europe 49
Sex life: Latin America 63, Europe 47
Physical mobility: Latin America 75, Europe 62
Overall mood: Latin America 71, Europe 63
Concentration/memory: Latin America 71, Europe 58
Motivation/drive: Latin America 72, Europe 64

Percentage rating fibromyalgia as having strong/very strong impact on various aspects of life

Clark P et al. BMC Musculoskelet Disord 2013; 14:188.
Economic Burden
# Workers with Fibromyalgia Pain Have Lower Quality of Life Scores

<table>
<thead>
<tr>
<th>Quality of life scores from SF-12v2</th>
<th>Workers with fibromyalgia pain</th>
<th>Workers without fibromyalgia pain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical component summary</td>
<td>36.4</td>
<td>50.6</td>
</tr>
<tr>
<td>Mental component summary</td>
<td>41.7</td>
<td>47.3</td>
</tr>
</tbody>
</table>

*SF-12v2 = Short-Form 12 version 2*

*Source: National Health and Wellness Survey (NHWS) 2008.*
Workers with Fibromyalgia Pain Have Reduced Productivity

Workers with Fibromyalgia Pain Have Higher Health Care Utilization

<table>
<thead>
<tr>
<th>Resource use in the past 6 months</th>
<th>Workers with fibromyalgia Pain (%)</th>
<th>Workers without fibromyalgia pain (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;1 doctor visit</td>
<td>92.4</td>
<td>72.5</td>
</tr>
<tr>
<td>&gt;1 non-traditional health care visit</td>
<td>41.5</td>
<td>21.8</td>
</tr>
<tr>
<td>&gt;1 ER visit</td>
<td>23.9</td>
<td>11.7</td>
</tr>
<tr>
<td>&gt;1 hospitalization</td>
<td>11.4</td>
<td>6.0</td>
</tr>
<tr>
<td>Number of prescription medicines</td>
<td>9.0</td>
<td>1.9</td>
</tr>
</tbody>
</table>

ER = emergency room
Workers with Fibromyalgia Pain Have Increased Health Care Costs

<table>
<thead>
<tr>
<th>Average annual costs per worker</th>
<th>Fibromyalgia pain</th>
<th>No Fibromyalgia pain</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Direct costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ER visit</td>
<td>$594</td>
<td>$229</td>
</tr>
<tr>
<td>Hospitalization</td>
<td>$3410</td>
<td>$1431</td>
</tr>
<tr>
<td>Physician visit</td>
<td>$2078</td>
<td>$777</td>
</tr>
<tr>
<td>Total direct costs</td>
<td>$2,082</td>
<td>$2,437</td>
</tr>
<tr>
<td><strong>Indirect costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lost income due to absenteeism</td>
<td>$4,760</td>
<td>$1,398</td>
</tr>
<tr>
<td>Lost income due to presenteeism</td>
<td>$11,206</td>
<td>$4,871</td>
</tr>
<tr>
<td>Total Indirect costs</td>
<td>$15,966</td>
<td>$6,269</td>
</tr>
<tr>
<td><strong>Total costs</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Direct + indirect costs</td>
<td>$22,048</td>
<td>$8,706</td>
</tr>
</tbody>
</table>

ER = emergency room
Health Economic Consequences Related to the Diagnosis of Fibromyalgia

Tests and Imaging

Resource use

- Observed
- Predicted

Costs

United Kingdom figures
Health Economic Consequences Related to the Diagnosis of Fibromyalgia

United Kingdom figures
Health Economic Consequences Related to the Diagnosis of Fibromyalgia

General Practitioner Visits

- Resource use
  - Observed
  - Predicted

- Costs

United Kingdom figures
Health Economic Consequences Related to the Diagnosis of Fibromyalgia

Drugs

<table>
<thead>
<tr>
<th>Resource use</th>
<th>Observed</th>
<th>Predicted</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5 year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5 year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.5 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.5 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Costs

- United Kingdom figures
Comorbidities
Pain Comorbidities of Fibromyalgia

Notes: Infrequent comorbid conditions were omitted from the chart.
MDD = major depressive disorder
The Paradigm of Pain: Interrelationship Among Pain, Sleep Disturbance and Psychological Symptoms

Management strategy for fibromyalgia patients is to improve overall patient functionality.

Many Fibromyalgia Patients Have Cognitive Complaints: “Fibro Fog”

- Compared to those without the condition, patients with fibromyalgia complain more often of:
  - Mental confusion
  - Memory decline
  - Speech difficulty

- Performance on cognitive tests shows they have poorer performance than age-matched controls on tasks involving:
  - Working memory
  - Recognition memory
  - Free recall
  - Verbal fluency
  - Verbal knowledge

Sleep Disturbances and Fibromyalgia

- Fibromyalgia patients may complain of:
  - Non-restorative sleep
  - Insomnia
  - Early morning awakening
  - Poor sleep quality

Sleep Deprivation and Pain

Pain Disrupts Sleep

Noxious pain stimuli → Arousal → Delta waves decrease
Alpha waves increase

Pain Disrupts Sleep: Clinical Evidence

- Several longitudinal studies have suggested pain intensity prospectively predicts sleep disturbances.
- However, prospective studies did not confirm sleep disturbances predict pain intensity.
- May explain:
  - Lack of significant analgesic effects of hypnotics.
  - Lack of association between cognitive behavioral therapy for insomnia and pain reduction.

How Sleep Disruption Contributes to Pain

- Sleep deprivation leads to hyperalgesia
- Relationship between pain and sleep appears to be reciprocal
- Deprivation or disruption of slow-wave sleep and sleep continuity disturbances may be associated with hyperalgesia
- Concurrent management of disturbed sleep and pain may break the vicious circle and alleviate both problems

Mood Disorders and Fibromyalgia

At time of diagnosis

- 20–40% have an identifiable mood disorder

Lifetime prevalence

- Depression: 75%
- Anxiety: 60%

In many cases, depression or anxiety may be the result of chronic pain.

Depression and Pain

Prevalence of pain in depressed patients is 15–100%

- Depressive symptoms rather than major depressive disorder
- Mostly musculoskeletal pain

Prevalence of major depressive disorder in patients with chronic pain is 15–50%

- Mostly in patients with multiple pain symptoms

Pain Stimuli Activate Brain Areas Related to Depression

BDI = Beck Depression Inventory; MPFC = medial prefrontal cortex
Fear-Anxiety-Avoidance Model

Without anxiety disorder

Nociceptive stimulus

Unpleasant sensation ➔ Appropriate behaviors

With anxiety disorder

Threatening and Catastrophic cognitions ➔ Inappropriate behaviors and exacerbation of pain

Anxiolytics or cognitive behavioral therapy are useful adjuvant treatments for patients with chronic pain
Burden of Illness of Fibromyalgia: Summary

- Fibromyalgia affects every aspect of a patient’s life:
  - Activities of daily living
  - Ability to work
  - Sleep
  - Psychological well being
- Fibromyalgia represents a significant burden on health care resources
- Fibromyalgia is associated with sleep and mental health comorbidities
- Sleep disruption can exacerbate the symptoms of fibromyalgia