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Falls in the Elderly with Fibromyalgia

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Learning Objectives

As a result of this course, participants will be able to:

- Discuss the prevalence of falls in patients with fibromyalgia based on current evidence
- Identify the risk factors for falls and fibromyalgia in the elderly
- Delineate the role of the occupational therapist in an interdisciplinary intervention for prevention of falls in the elderly with fibromyalgia
Falls in the Elderly

- More than one out of four adults (≥ 65 years) falls each year
- 2.8 million emergency room visits (CDC, 2016)
- In 2012–2013, unintentional injuries accounted for 85% of all injury deaths among adults (≥ 65 years) in the U.S.
- 55% of these deaths were due to falls
- Age-adjusted fall injury death rate in this age group doubled from 2000 to 2013 (CDC, 2015)

(Centers for Disease Control and Prevention [CDC])

Falls in the Elderly

In 2012–2013, the fall death rate in adults ≥ 85 years was

- nearly 4 times higher than in adults aged 75–84 years, and
- 16 times higher than in adults aged 65–74 years (CDC, 2015)

- Average hospital cost for a fall injury is $35,000
- Cost increases with age (Stevens, Corso, Finkelstein, & Miller, 2006)
Falls in the Elderly

- Falls pose a serious threat to elderly individuals
- Memory of pain & decreased confidence
- Self-limiting of participation in activities (Schepens, Sen, Painter, & Murphy, 2012)
- Fear of falling affects muscle strength, cardiovascular endurance, and agility (Jeoung, 2015)

Fibromyalgia

- Prevalence: 2%
- Female:Male ratio is 7:1
- Often runs in families
- Most are diagnosed between 20–50 years of age
- Incidence rises with age

(CDC, 2015)
Fibromyalgia

- Risk of fibromyalgia is higher in those with rheumatic conditions

- No diagnostic tests for fibromyalgia. Lab tests may be performed to rule out other conditions

- Diagnosis is based upon the ACR criteria

(American College of Rheumatology [ACR], 2015)

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Fibromyalgia

1990 ACR criteria:
- Widespread pain present for at least 3 months
- At least 11 out of 18 tender points

2010 ACR criteria:
- Widespread Pain Index and Symptom Severity scale scores
- Symptoms present at the same level for at least 3 months
- No other disorder present that could explain the pain

(ACR, 2015)
Falls and Fibromyalgia

- Previous studies have shown a clear association between falls and fibromyalgia.
- However, fibromyalgia is an under-investigated condition, especially in the elderly.
- More evidence in older adults.
- Confusing clinical presentation due to presence of co-morbidities and multi-system involvement in the elderly.

Cross-sectional study
- 125 women with fibromyalgia (age: 55.42 ± 10.35 years)
- 115 without fibromyalgia (age: 54.23 ± 10.68 years)

Variables assessed
- age
- fear of falling
- number of falls
- body composition
- balance performance
- lower limb strength
- health-related quality of life
- impact of fibromyalgia

(Collado-Mateo et al., 2015)
Falls and Fibromyalgia

Those with fibromyalgia were found to have
- poorer balance control
- 33% higher fear of falling
- more than 3 times the number of falls compared to women without FM
- Poorer health-related quality of life and perceived health status

Perceived balance problems more closely associated with fear of falling than objective balance performance

(Collado-Mateo et al., 2015)

Falls and Fibromyalgia

Cross-sectional pilot study
- 25 patients with fibromyalgia
- 27 age-matched healthy controls (HCs) (combined mean age: 48.6 ± 9.7 years)

Variables assessed
- Differences in dynamic posturography
- Association of postural instability with
  - strength, proprioception and lower-extremity myofascial trigger points (MTPs);
  - fibromyalgia symptoms and physical function;
  - dyscognition;
  - balance confidence;
  - medication use
- Self-report of falls over the past 6 months

(Jones, King, Mist, Bennett, & Horak, 2011)
Falls and Fibromyalgia

- Patients with fibromyalgia- consistent objective sensory deficits on dynamic posturography, despite a normal clinical neurological examination
- Reported significantly less balance confidence than HCs
- 76% to 84% had gastrocnemius and/or anterior tibialis MTPs.
- 3 (11%) of 27 HCs had fallen only once during the past 6 months
- 18 (72%) of 25 FM patients had fallen at least once
- 15 FM patients (60%) reported falling at least 3 times in the past 6 months

(Jones, King, Mist, Bennett, & Horak, 2011)

know the risk
### Risk Factors for Falls

<table>
<thead>
<tr>
<th>Intrinsic factors</th>
<th>Extrinsic factors</th>
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<tbody>
<tr>
<td>• previous falls</td>
<td>polypharmacy</td>
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<tr>
<td>• muscle weakness</td>
<td>psychoactive medications</td>
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<tr>
<td>• gait and balance impairment</td>
<td>environmental hazards</td>
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<tr>
<td>• visual impairment</td>
<td>improper footwear</td>
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<tr>
<td>• advanced age</td>
<td>improper use of assistive device</td>
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<td>• orthostasis</td>
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<td>• chronic conditions including arthritis, diabetes, stroke</td>
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<td>• cognitive impairment</td>
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<td>• incontinence</td>
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<td>• pain</td>
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<td>• fear of falling</td>
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<td>• vitamin D deficiency</td>
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<td>• depression</td>
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<td>• vertigo/dizziness</td>
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<td>• sleep dysfunction</td>
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### Risk Factors for Fibromyalgia

- An under-diagnosed and misunderstood condition with unclear etiology and risk factors

- Belongs to the family of affective spectrum disorders (ASD) that generally co-occur and are seen among families

(Hudson et al., 2003; Hudson et al., 2004)
## Risk Factors for Fibromyalgia

Factors associated with onset of fibromyalgia

- female sex
- family history
- genetic predisposition
- rheumatic diseases (lupus, RA)
- sexual, physical (car accidents, injuries, viral infections), and emotional trauma (PTSD)
- obesity

(Arnold et al., 2004; CDC, 2015; Hudson et al., 2004; Raphael et al., 2004; Rossy et al., 1999 Walker et al., 1997)

## Symptoms of Fibromyalgia

- List common symptoms of fibromyalgia
- Compare risk factors for falls and symptoms of fibromyalgia
- Focus on common items that increase fall risk
### Symptoms of Fibromyalgia

- chronic widespread pain
- impaired cognition affecting memory and concentration
- sleep dysfunction
- irritable bladder
- morning stiffness
- dry eyes and mouth
- anxiety, depression
- dizziness
- Raynaud’s Syndrome
- impaired balance and coordination
- decreased muscle strength
- tingling and numbness of hands and feet
- co-occurrence with other conditions such as IBS, SLE, and arthritis


### Risk Factors for Falls in Fibromyalgia

#### Risk factors for falls

- previous falls
- muscle weakness
- gait and balance impairment
- advanced age
- orthostasis
- chronic conditions including arthritis, diabetes, stroke
- cognitive impairment
- incontinence
- pain
- fear of falling
- vitamin D deficiency
- depression
- vertigo/dizziness
- sleep dysfunction
- Extrinsic factors
- polypharmacy
- psychoactive medications
- environmental hazards
- improper footwear
- improper use of assistive devices

- chronic widespread pain
- moderate to severe fatigue
- sleep dysfunction
- morning stiffness
- tingling and numbness of hands and feet
- co-occurrence with other conditions such as IBS, SLE, and arthritis.
- headaches and migraines
- irritable bladder
- visual problems
- impaired cognition affecting memory and concentration
- dry eyes and mouth
- anxiety, depression
- dizziness
- Raynaud’s Syndrome
- impaired balance and coordination
- decreased muscle strength
- gait variations
Evaluation

History Intake
- A very important step in patients with fibromyalgia
- Allow sufficient time for a detailed history

Obtain detailed information on:
- Current complaints
- Previous falls
- Medications
- Visual complaints
- Dizziness
- Sleep problems
- Memory and concentration difficulties
- Family, social, and occupational roles
- Prior successful and unsuccessful treatment interventions
Evaluation

Comprehensive OT assessment of physical, cognitive, and functional status including:

- Pain level and tenderness
- Fatigue
- ROM and muscle strength
- Balance and coordination
- Attention span, Memory, Sequencing ability, Problem solving, Judgment, and Impulsivity
- Environment
- ADL skills

Tools for assessment of falls in the elderly:

- Modified John Hopkins Fall Risk Assessment Tool (mJH-FRAT) - sensitive and specific for identifying patients at risk for falls with injury among community-dwelling elderly individuals
- Missouri Alliance for Home Care Fall Risk Assessment Tool (MAHC-10) - valid for fall risk screening with a suggestion for a higher cutoff score for more accurate prediction

(Calys, Gagnon, & Jernigan, 2012; Hnizdo, Archuleta, Taylor, & Kim, 2013)
Evaluation

Some tools used in patients with fibromyalgia

- Brief pain inventory average pain visual analogue scale for pain intensity
- Depression subscale of the hospital anxiety and depression scale (HADS-D) for depression
- Multiple ability self-report questionnaire (MASQ) for cognitive dysfunction
- Fatigue severity scale (FSS) for fatigue
- Revised fibromyalgia impact questionnaire (FIQR) for multidimensional function/health-related quality of life
- Jenkins Sleep Scale (JSS) for sleep disturbance
- Manual tender point survey-Fibromyalgia intensity score (MTPS-FIS) for tenderness

(Boomershine, 2012)

Evaluation

Revised Fibromyalgia Impact Questionnaire

- Commonly used for evaluation of symptoms
- 3 domains: Function, Overall impact, Symptoms
- 21 individual questions graded on an 11-point numeric rating scale of 0-10, with 10 being "worst"
- Completed in less than 2 minutes
- Easy to score

(Bennett et al., 2009)
Evaluation

Post-evaluation, discuss

- Evaluation findings
- Patient expectations
- Therapy goals

Fall Prevention in Fibromyalgia

- Integrated team approach
- Consider alternatives if response not satisfactory
- Refer patient to other disciplines as needed
Integrated Team Approach

- Physician (Rheumatologist)
- Nurse
- Family/Caregiver
- OT
- PT
- RT
- CBT
- Ophthalmologist
- Sleep specialist
- Patient

Risk Factors for Falls in Fibromyalgia

1. Pain
2. Muscle weakness
3. Gait and balance impairment
4. Arthritis
5. Sleep dysfunction

- Visual impairment
- Dizziness
- Depression
- Psychoactive medications
- Cognitive impairment

Narayan/OccupationalTherapy.com
Fall Prevention-Exercise

In the elderly, exercise has been proven to be effective in

- reducing the risk of falls
- fear of falling

(Oh et al., 2012)

Fall Prevention-Exercise

In patients with fibromyalgia, low to moderate intensity exercise of any type found to be effective in

- Decreasing pain
- Decreasing fatigue
- Improving sleep
- Improving mood

Exercises involving higher impact movements or requiring a higher heart rate such as running and jumping—highest attrition rates
Fitness gains in older subjects comparable to gains in age-matched healthy controls

(Jones, Adams, Winters-Stone, & Burckhardt, 2006)
Fall Prevention-Exercise

Person-centered progressive resistance exercise, in patients with fibromyalgia, improves
• muscle function
• health status
• current pain intensity
• ADL participation

A longer period of guidance and support recommended for maintaining regular exercise habits

(Larsson et al., 2015)

Fall Prevention-Exercise

Eccentric muscle loading-- minimized in patients with fibromyalgia, as it can cause delayed onset muscle soreness

Limit
• overhead arm work
• exercises done with limbs farther away from the body's midline

(Jones, 2015)
**Fall Prevention-Exercise**

Aquatic aerobic exercise program more effective in patients with fibromyalgia compared to

- gym-based aerobic exercise program and
- home-based isometric stretch and strengthening program

(Sevimli, Kozanoglu, Guzel, & Doganay, 2015)

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**Fall Prevention-TENS**

- High frequency TENS combined with aerobic exercise- more effective in decreasing pain in patients with fibromyalgia compared to exercise alone
- TENS- reduces central excitability and activates central inhibition pathways

(Carbonario, Matsutani, Yuan, & Marques, 2013)
Fall Prevention-Mind Body Intervention

Tai Chi
In physically inactive elderly individuals, it has been found to be effective in

- improving balance and
- decreasing the number of falls and
- decreasing the risk and fear of falling

(Li et al., 2005)

Fall Prevention-Mind Body Intervention

In patients with fibromyalgia, Tai Chi improves

- pain
- sleep
- balance
- functional mobility

(Jones et al., 2012; Wang et al., 2010)
Fall Prevention-Mind Body Intervention

Yoga and meditation

Yoga has been found to be effective in

- decreasing pain and altering cortisol levels in women with fibromyalgia
- improving postural control/balance in the elderly

(Curtis, Osadchuk, & Katz, 2011; Kelley, Aaron, Hynds, Machado, & Wolff, 2014; Saravanakumar, Higgins, van der Riet, Marquez, & Sibbritt, 2014)

Fall Prevention-Mind Body Intervention

Mindfulness meditation-effective in patients with fibromyalgia in reducing

- perceived stress
- basal sympathetic activation
- anxiety
- depressive symptoms

(Cash et al., 2015; Lush et al., 2009; Hennard, 2011; Sephton et al., 2007)
Fall Prevention-Mind Body Intervention

- Visual Biofeedback training- improves balance in the elderly
  (Kang, 2013)

- EMG biofeedback- effective in reduction of pain in fibromyalgia patients
  (Babu, Mathew, Danda, & Prakash, 2007; Glombiewski, Bernardy, & Häuser, 2013)

Fall Prevention-Home Modification

Occupational therapists play a major role in
- evaluating home hazards
- recommending modifications based on patient’s status

Modify environment to
- maximize safety
- maximize independence
Fall Prevention- Exercise

Physical therapy
- pain and tenderness, especially involving the low back and lower extremities
- balance exercises
- lower limb strengthening
- gait training

Recreational therapy
- evaluation of patient interests and daily activities
- planning and organizing activities to maximize physical function

Fall Prevention-Sleep

Sleep dysfunction in fibromyalgia includes
- nonrestorative sleep
- waking up unrefreshed
- sleep apnea
- restless legs

Polysomnography data has revealed
- frequent awakenings during the night
- reduced short-wave sleep
- abnormal alpha-wave intrusion in the 4th stage of non-REM sleep (alpha-delta sleep)
- Deficit of growth hormone and insulin-like growth factor involved in muscle microtrauma repair

(Bennett, Clark, Campbell, & Burckhardt, 1992; Choy EH, 2015; Prinz et al., 1995; Van Cauter, Plat, & Copinschi, 1998)
Fall Prevention-Sleep

Evaluation

- current sleep-related complaints
- medications
- day and evening schedules
- sleep environment

Fall Prevention-Sleep

Treatment Intervention

- **Sleep hygiene & environment:** Establish a consistent sleep schedule, avoid napping, avoid liquids for 2-3 hours prior to bedtime, ensure safety for nocturnal toileting, adjust lighting, reduce noise, and adjust to a comfortable room temperature.
- **Relaxation strategies:** Deep breathing, tai chi, and yoga.
- **Daytime behaviors:** Physical activity and exercise, social engagement, alcohol intake, discuss medications and refer patient to physician accordingly.

Referral for further evaluation to a sleep specialist for (polysomnography or sleep study), especially if sleep apnea suspected.
Fall Prevention - Vision

Common visual complaints in fibromyalgia

- blurred vision
- dry eyes

Fall Prevention - Vision

Treatment Intervention

- Environmental modifications such as organization to remove clutter, removal of obstacles and throw rugs etc. for safety, adequate lighting, use of contrasting colors and tapes.
- Decrease or eliminate driving
- Use of large print
- Use of pill boxes with meds clearly differentiated using labels with large print, tape etc.

Referral to ophthalmologist for assessment of these symptoms and visual acuity

Blurriness -- also a sign of serious conditions including cataracts, macular degeneration, diabetic retinopathy, stroke etc.
Fall Prevention-Dizziness

Dizziness—a very common complaint among patients with fibromyalgia

Previous studies have associated dizziness in fibromyalgia with

- autonomic nervous system dysfunction (POTS)
- brainstem dysfunction
- vestibulospinal pathway dysfunction
- use of pregabalin, an anticonvulsant

(Bayazit et al., 2010; Boomershine, 2010; Rosenhall, Johansson, & Orndahl, 1996; Staud R, 2008)

Fall Prevention-Dizziness

Intervention

- Slow change in position from supine to stand
- Educating and training patient in avoidance of sudden changes in position during ADLs
- Adequate hydration
- Frequent BP checks
- Avoid prolonged inactivity/bedrest
- Initiate exercise program with slow warm-up exercises
- Review patient’s medications
Fall Prevention-Dizziness

Vestibular rehabilitation
- not investigated in fibromyalgia

- found to be effective for dizziness in the elderly with no documented vestibular deficits

- indicated in patients with anxiety disorders complaining of ill-defined vestibular symptoms

- vertigo with uncertain etiology

(Bayat et al., 2012; Han, Song, & Kim, 2011)

Fall prevention-Dizziness

Refer patient to nurse/physician for

- evaluation of POTS/orthostatic intolerance

- possible alternatives if medication use suspected to be the cause of dizziness
Fall Prevention - Depression and Anti-depressants

Possible contributing factors
- Chronic pain
- Stress resulting from inability to meet expectations and fulfill obligations
- Isolation due to deteriorating relationships
- Poor sleep quality
- Antidepressant use (SSRIs) has been found to be associated with falls in older adults (Marcum et al., 2016)

Role of OT
- Address pain
- Assist patient in planning, organizing, decluttering, reasoning, and managing expectations
- Advise patient regarding balance between obligations and personal interests
- Enquire regarding patient interests and provide patient with necessary information/resources to encourage participation
- Encourage social engagement when appropriate
- Address sleep concerns
- Review medications
Fall Prevention-Depression and Anti-depressants

- Referral to cognitive behavioral therapist when appropriate for individual/family therapy.
- Evidence of the effectiveness of CBT in the treatment of depression in fibromyalgia.

(Menga et al., 2014; Minelli & Vaona, 2012)

Fall Prevention-Cognition

- Primarily attention and memory problems
- Several assessment tools available to identify areas affected.
- Test of Everyday Attention
Fall Prevention-Cognition

- Address sleep dysfunction
- Assess possibility of medications as the cause
- Establish consistent routine
- Plan activities based on patient's interests
- Breakdown complicated and tedious tasks
- Use of memory aids
- Memory training using association, repetition etc.
- Refer to CBT

Questions

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