Falls In The Elderly

Background
1. General information
   o The most consistent predictor of future falls are clinically detected abnormalities of gait and balance\(^1\)
   o Gait and balance disorders have been shown to be associated with a three-fold increase in fall risk\(^2\)
   o Functional assessment instruments are appropriate for risk assessment of community dwelling elderly individuals, where functional status is very predictive of fall risk status\(^3\)
   o Complications resulting from falls are the leading cause of death from injury in men and women older than age 65\(^1\)
   o Costs of fall related injuries in the elderly estimated $12.6 billion in 1995\(^4\)

Pathophysiology
1. Incidence, prevalence
   o About one third of community dwelling persons over the age of 65 fall each year\(^1\)
   o Incidence of falls increases to 50% for people 80 years and older\(^5\)
   o In a survey of over 90,000 individuals over 65 years old, 16% reported a fall in the prior three months\(^5\)
2. Morbidity/ mortality
   o Twenty percent of fall incidents require medical attention\(^6\)
   o 5-10% of community-dwelling older persons who fall sustain a serious injury\(^1\)
     - Major head trauma
     - Major lacerations
     - Fracture
   o The 1% of fallers who sustain hip fracture have a 20-30% 1 year mortality\(^2\)
     - 25-74% community elders with hip fracture do not recover functional status
   o Fall injuries associated morbidity\(^3\)
     - Decline in functional status
     - Increased likelihood of nursing home placement
     - Greater use of medical services
3. Risk factors
   o History of falls
   o Intrinsic factors
     - Lower extremity weakness
     - Gait deficit
     - Balance deficit
     - Visual deficit
     - Arthritis
     - Impaired ADL
     - Depression
     - Cognitive deficit
     - Polypharmacy
• Age >80 years
  o Extrinsic factors
    • Poor footwear
    • Environmental hazards
    • Use of assistive device

Diagnosis
  1. History
    o Ask all older patients about falls in the past year
    o For patients reporting a single fall, assess for gait/balance problems using a functional assessment scale
    o Patients reporting recurrent falls should undergo a comprehensive fall evaluation
  2. Physical examination
    o Assessment of gait/balance
      • Use functional assessment scale
        • Berg balance test
        • Elderly fall screening test
        • Dynamic gait index
        • Timed Up and Go/ Get Up and Go (recommended by American Geriatrics Association)
        • Tinetti performance oriented mobility assessment
        • Modified gait abnormality rating scale
      • Literature review of 21 articles describing 20 fall risks risk assessment scales found 2 of 6 functional risk assessment tools had high sensitivities and specificities
        • Elderly fall screening test, sensitivity 93%, specificity 78%
        • Timed Up and Go, sensitivity 87%, specificity 87%, 98% interrater reliability
    • Timed up and go
      • Patient is observed standing from a chair without using their arms, walking several paces, and returning to seat
      • If gait/balance abnormality noted, a fall evaluation should be performed
    o Comprehensive fall evaluation
      • Fall evaluations should be performed by a clinician with appropriate skills and experience, therefore referral to specialist (ie Geriatrician) may be necessary
      • Assessment should include the following:
        • History of fall circumstances
        • Medications with side effects that may contribute to falls (i.e., orthostatic hypotension, psychotropic)
        • Vision assessment
        • Gait and Balance assessment
        • Lower limb joint function
        • Cardiovascular function including heart rate and rhythm, orthostatic vitals signs, and vital sign response to carotid stimulation when appropriate
• Neurological function including mental status, muscle strength, reflexes, tests of cortical, extrapyramidal and cerebellar functions

3. Diagnostic testing
   o As indicated by fall evaluation

**Therapeutics**

1. Single interventions
   o Exercise (SOR:A)
     - Many proven benefits, but optimal type, duration and intensity unclear
   o Environmental modification (SOR:B)
     - Facilitated environmental home assessment indicated for patients with increased fall risk or discharged home after hospitalization for fall.
   o Assistive Devices (SOR:B)
     - No direct evidence that assistive devices alone will prevent falls, but they may be of benefit in multifactorial interventions.
   o Medications (SOR:C)
     - Patients with history of falls should have medications reviewed and adjusted as necessary, especially those patients taking more than 4 medications or psychotropics.
   o Behavioral and educational programs (SOR:B)
     - These programs do not reduce falls when used in isolation, however can be of benefit as part of a multifactorial intervention.

2. Multifactorial interventions
   o Among community dwelling older persons a multifactorial intervention should include the following:
     - Gait training and advice on appropriate use of assistive devices (SOR:B)
     - Review and modification of medications (SOR:A)
     - Exercise programs with balance training (SOR:A)
     - Treatment of postural hypotension (SOR:A)
     - Modification of environmental hazards (SOR:B)
     - Treatment of cardiovascular disorders (SOR:B)

**Follow-up**

1. Return to office
   o Patients without prior history of a fall should be screened annually for falls
   o Patient reporting a fall in the past year they should undergo a multifactorial fall risk assessment for prevention
   o Appropriate interventions and follow up should be initiated based on risk assessment and fall evaluation

2. Refer to specialist
   o As indicated by fall evaluation (i.e., Neurology if underlying neurological disorder, Ophthalmology if visual deficits, Cardiology if carotid sinus disorder)
**Prognosis**

1. Less than 10% of falls in elderly result in fracture, however falling is associated with significant morbidity, mortality and reduced functioning in elderly people. \(^6,7\)

**Prevention**\(^6\)

1. Multiple-component group exercise reduces rate of falls and risk of falling
   - As does Tai Chi, and individually prescribed multiple-component home-based exercise (SOR:A)
2. Multifactorial interventions do reduce the rate of falls but not risk, of older people living in the community. (SOR:A)
3. Vitamin D has not been shown to reduce falls overall but may do so in people with lower vitamin D levels. (SOR:A)
4. Home safety interventions have not been shown to reduce falls (SOR:A)
5. Gradual withdraw of psychotropic medications can reduce rate of falls but not risk of falling. (SOR:A)
6. Hip protectors
   - Offer no protective effect with respect to hip fractures

**Differential Diagnosis**\(^1\)

1. Orthostatic hypotension
2. Visual Impairment
3. Gait and/or balance disorder
4. Cognitive impairment

**Patient Education**


**Evidence-Based Inquiries**

1. Does the use of hip protectors prevent fractures in elderly persons?

**References**

http://www.chcr.brown.edu/GERIATRIC_ASSESSMENT_TOOL_KIT.PDF

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