Prevention of falls and fractures

Key Points

- Falls are the main cause of fractures or broken bones at any age and are preventable.
- Morbidity and mortality from falls and fractures is high.
- The major predictors of falls include low bone density, impaired postural stability and reduced lower limb muscle strength.
- Falls risk should be assessed and risk factors modified.
- Bone mineral density should be assessed and treated if low.

Falls are the main cause of fractures or broken bones at any age.

A fall is an event during which a person inadvertently comes to rest on the ground or at other lower level [1]. Falls are preventable [2,3].

They result in injuries, loss of confidence and subsequent reduction in activity levels and community participation [4].

Risk of falling is increased with age, 3 or more medical conditions, 4 or more medications, vision or hearing decline, syncope, poor balance, slower gait, vascular diseases, Diabetes, Parkinson's disease, urinary incontinence, sarcopenia and dementia. With every additional medical condition diagnosed before the age of 60, the risk of falling increases by 8%. After the age of 60, this increases to 35% with every additional medical condition such as high blood pressure, asthma or arthritis [1, 5,6].

90-95% of hip fractures are caused by falls, 25% of those patients will die within 12 months and a further 25% never regain complete mobility. Those who lie on the ground for more than an hour do worse [1,7].

Balance and bone density decline significantly between the age of 40 and 60 and this age usually coincides with menopause. Some sobering statistics are that:

- 1 in 5 women will fall each year before they reach 60.
- After 65 years 1 in 3 will fall each year.
- 30 % of these falls result in mod-severe injuries: head trauma, hip fracture (1%), other fractures (5%), lacerations and dislocations [1,2,7,8].

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- Women over 80, 1 in 2 will fall each year.
- After the age of 50, 1 in 2 women will suffer a broken bone (fracture) due to a fall in their remaining life-time.

Bone Density

- DXA scan of the femoral neck [hip] and lumbar spine are the most effective in diagnosing low bone density. (Heel [calcaneus] bone scans sometimes available at pharmacies are not reliable in diagnosing osteoporosis).
- Women over 60 with osteoporosis (T score <-2.5) have double the risk of falls of those with normal bone density (BMD)[2].
- The rate of falls-related fractures is inversely related to bone density·[2].

Predicting and assessing Falls Risk

The major predictors of falls include low bone density, impaired postural stability and reduced lower limb muscle strength. These factors are synergistic·[2].

The strongest single predictor of future falls is a history of previous falls. Assessment of physical functioning is the next strongest·[4].

Falls risk screen – ask about 2 or more falls in the past 12 months, presenting after an acute fall or an individual who self-reports or is observed to have difficulty with walking or balance. Yes, to any one of these suggests a high risk of falls and needs a multifactorial assessment. No, but a fall in the last 12 months requires evaluation of gait and balance·[9]. Even simpler is the "Stay on Your Feet" approach – investigate any older person who has fallen in the past 12 months or experiences difficulties walking or balancing·[10].

More detailed health professional and self-checks are available and these are important for developing strategies to prevent further falls. These include FROP-Com, Quickscreen·[10, 11], the iSOLVE project·[3], the FRAST·[9] and the STEADI programme·[12].

The Timed Up and Go (TUG) is an objective physical measure, is easy to administer and is a reasonable predictor of risk for community dwelling older people who take more than 12-14 seconds·[1,12,13]. It is best combined with an examination of gait·[13].

Recommendations for reducing falls risk

- Improving muscle quality, strengthening weak muscles and correcting postural alignment are essential elements in older adults with osteoporosis·[6].
- Adequate vision, proprioception, reaction time and muscle strength are needed for postural control(balance)·[4].

- Exercises need to challenge balance (e.g. Otago, LiFE, Tai Chi) and strengthen muscles. They need to be on going and for at least two hours a week in either a group or home setting. Loss of confidence and fear of falling should be addressed. Walking should not be prescribed for high risk individuals or used as the sole exercise.[1,3,4,8,10,14].

- Other risk factors requiring single and multifactorial interventions need addressing:

- Environmental hazards identified, especially around the home – institute hand rails, non-slip surfaces, outside pathway management, walking aids if needed.

- Medical review of conditions and medications to improve balance and reduce dizziness. Visual correction and attention to footwear and foot pain.[1,4,14,15].

- Encourage improvements in lifestyle and nutrition to assist muscle strength and maintain adequate calcium and vitamin D levels and reduce the impact of chronic diseases.[1,14,15].

Recommendations for maintaining or improving bone density.

- Calcium is an essential ingredient for bone health but does not prevent fractures in those who have osteoporosis (especially adults who have had a fragility fracture). A minimum of 1200gm per day is recommended, preferably from dietary sources, with no more than 600mg supplementation.[1,14].

- Vitamin D helps absorb calcium and regulate its blood levels as well as maintaining the skeleton. Inadequate levels (<50 nmol/L at the end of winter) are common in Australia (30%). People who spend little time in the sun, who wear full length clothing and/or cover their head and those who always use sunblock are at higher risk of low Vitamin D levels. Supplementation may be required in addition to safe sun exposure. 800iu D3 per day is considered enough to maintain adequate levels, more is needed to attain them.[1,14].

- Anti-osteoporosis medications, including menopausal hormone therapy MHT/HRT, reduce the risk of initial and especially further fractures by up to 70% with appropriate management. For details see OA website Living with Osteoporosis - Treatment Options.[8,14].

- Exercise and regular physical activity are important throughout life. Weight bearing, higher impact activities and progressive resistance training can be osteogenic but need to be tailored for different stages of life. Balance and mobility exercises help reduce falls but do not improve bone strength. For details see OA website Prevention- Exercise.[4,14].

Combining the recommendations for improving balance and bones is the best approach to preventing falls and fractures as you age.

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