Educating patients and their families about adverse drug effects, such as dizziness, hypotension, or visual disturbance, is a critical part of good nursing care. However, not every nurse considers the risk of patient falls due to medication use. When we think about the potential adverse effects of benzodiazepines, anti-arrhythmics, or psychotropics, for example, does falling or loss of balance come to mind? Benzodiazepines cause known changes in the central nervous system, prompting us to caution patients to take care when driving, warn them about drinking alcohol, and discuss the potential for drowsiness. With the class of anti-arrhythmic such as quinidine, we warn patients to be alert for symptoms of hypotension. We especially are alert with psychotropic medications in regard to adverse effects such as sedation and drowsiness. However, did we realize these medications could lead to an emergency room visit for a patient due to a fall and/or fracture?

Individuals over age 65 and children under age 5 are most likely to fall (Akyol, 2007). However, a child’s fall is not likely to lead to death. For adults over age 65, falls are among the most common accidents and also one of the leading causes of death (Akyol, 2007; Quigley, 2007; Rubenstein, 2006). The fifth leading cause of death in older adults in the United States is unintentional injuries, with falls being the cause of two-thirds of these deaths (Rubenstein, 2006). In a study of 20,551 patients who had fallen, French and colleagues (2006) determined that patients using drugs affecting the central nervous system fell more often than any other patient group. Polypharmacy (defined as use of more than three or four medications) also increased the risk for falls (French, Campbell, Spehar, Cunningham, & Fouls, 2005; Ziere et al., 2006).

A number of intrinsic and extrinsic factors affect elders’ fall risk. Visual impairment, urinary frequency, impaired balance or gait, changes in cognition, orthostatic hypotension, and environmental hazards can contribute to falls in older adults (Akyol, 2007; Ganz, Bao, Shekelle, & Rubenstein 2007; Hartikainen, Lonnroos, & Louhi, 2007; Krauss et al., 2005). However, these studies demonstrate medication use as a consistent, common factor in falls by older adults.

Healthy People 2010 (Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Services, 2000) identified injury and violence prevention as one of the nation’s leading health indicators for the future. Fall prevention is one form of health promotion, and nurses play a major role in health promotion and injury prevention. Classes of drugs and specific medications which can increase a patient’s risk for falling will be discussed.

Medication Considerations

The risk for falls increases every time the number of medications taken by the patient also increases. With polypharmacy, the factors leading to an increase in fall risks for the older adult are adverse drug effects, drug interactions, electrolyte imbalance, and decreased drug clearance rates with aging (Jasniewski, 2006). In an attempt to identify medications most likely to cause falls, researchers found that polypharmacy involving at-risk medications was more likely to increase the occurrence of fractures (French et al., 2007). With every drug added to a patient’s list of medications, the risk increases of creating a
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drug interaction as well as using a drug that could cause a fall (Ziere et al., 2006). This becomes especially important if the patient is taking more than one drug that increases the risk for falls. Fick and colleagues (2003) created a list of medications that were potentially inappropriate for elders; he and colleagues updated Beers list several years later (Fick et al., 2003). This simple resource can help the nurse perform patient teaching about potentially risky medications. Also of importance is the need to ask all patients about drug and alcohol use, regardless of their age. Zanjani and Oslin (2006) noted that asking older adults about substance abuse is frequently overlooked by health care providers who do not see it as a problem in that age group. In fact, substance abuse is a major problem.

Along with effects of polypharmacy, medications that influence the central nervous system (CNS) can cause drowsiness and sedation. These include benzodiazepines, opiates, centrally acting muscle relaxants, spasmyloytics, antidepressants, antiepileptics, antipsychotics, and medications for movement disorders. A study of patients who had hip fractures secondary to a fall concluded that not only was polypharmacy a cause of falls, but central nervous system agents also were implicated (French et al., 2005). According to Ganz and colleagues (2007), psychotropic medications are most related to an increase in falls in the older adult; however, they also indicated that all medications acting on the central nervous system can increase a patient’s risk of falling. No difference in fall risks was found between patients using typical antipsychotics (haloperidol [Haldol®], chlorpromazine [Thorazine®]) and atypical antipsychotics (clozapine [Clozaril®], olanzapine [Zyprexa®], risperidone [Risperdal®]), although clinicians believed anecdotally that there was a difference (Hien et al., 2005). Although the atypical antipsychotics had a lower risk to cause extrapyramidal side effects, the risk of falls was equal for both types of antipsychotic medications.

Drugs that depress the central nervous system may cause sedation, drowsiness, ataxia, and motor retardation as well as paradoxical effects (Aschenbrenner & Venable, 2009). These side effects may cause a patient to fall, regardless of his or her age. It is important to mention again that alcohol and drugs of abuse, either alone or in combination with other medications acting on the central nervous system, have CNS effects that can increase the risk of fall and fracture.

Cardiovascular drugs, such as the type 1A anti-arrhythmics (quinidine [Quinaglute®], procainamide [Pronestyl®], disopyramide [Norpace®], and moricizine [Ethmozine®]), digoxin (Lanoxin®), and diuretics demonstrated a higher risk for falls than any other cardiovascular drugs (Keller & Slattum, 2003; van der Velde, Stricker, Pols, & van der Cammen, 2006). Potential side effects of these drugs are orthostatic hypotension, dose-related hypotension, water and electrolyte imbalances, weakness, and cardiac arrhythmias (Jasniewski, 2006). An increased risk for community-related fractures also has been found in patients taking any cardiovascular medications (French et al., 2007), including beta blockers, alpha blockers, angiotensin inhibitors, and calcium channel blockers. Risk generally was related to the hypotensive effect of these medications. Hartikainen and colleagues (2007) remind us also to screen patients who may be using cardiovascular medications for new and other indications, such as alpha blockers for prostatic hyperplasia.

Diabetic medications may contribute to fall risk by causing hypoglycemia. These include insulin and oral agents such as rosiglitazone (Avandia®), glimepiride (Amyl®, glipizide (Gluco- trol®), glyburide (Micronase®), and pioglitazone (Actos®) (Krauss et al., 2005). Hypoglycemia may lead to dizziness or syncope, which may result in a fall. Complications from diabetes, such as peripheral neuropathy or polyuria, also may result in an increase in falls.

Medications used directly in the eye, such as miotic and nonmiotic eye medications, can cause a change in vision. Jasniowski (2006) reported that systemic effects of topical medications to treat glaucoma may increase an older adult’s chance of falling five times over those in similar patient groups. Effects were noted to be similar to those of beta blockers, including bradycardia and hypotension.

Reducing Risk Factors

The older adult is at increased risk for falls due to many factors. Changes in balance or gait, impaired cognition, depression, dizziness, vertigo, urinary frequency, orthostatic hypotension, visual impairments, environmental hazards, sensory deficits, and foot and footwear problems may affect fall risk (Fortinsky et al., 2004; Krauss et al., 2005). Some risk factors are modifiable, while others are not. Medication management is a tool that can be used by the nurse in any setting to help decrease the risk of falls among high-risk patients. Patients should be asked to bring all medications, including over-the-counter products, drug samples, and herbal preparations, to every office visit with every provider in order to provide appropriate medication reconciliation. The nurse should check medications for duplications between generic and brand names, and use the Beers criteria to identify potentially inappropriate medications.
Patients should be taught to remain alert to high-risk adverse effects, such as hypotension, sedation, hypoglycemia, and dizziness, and instructed in the importance of returning for drug serum monitoring to avoid potential toxicities. A pharmacist can be involved to look for possible dangerous drug combinations and unpredictable adverse effects. The nurse should provide the patient with a medication sheet or card to list medications and carry it for easy updating when changes are made. The patient also can be reminded to consult neighborhood pharmacists concerning choices of over-the-counter medications and preparations. Patients with diabetes should know the signs and symptoms of hypoglycemia as one fall prevention strategy. They also should be instructed in home blood glucose monitoring and advised to increase monitoring when medications or doses are altered or changed. Patients who use topical medications, such as eye drops or patches, may not think the side effects they experience are related to their medications. Patient awareness of drug absorption rates, avoiding overuse of eye drops, and removing old patches before applying new ones can help prevent falls.

In summary, the research suggests a significant relationship between medications and falls in older adults. The risk for falls also increases when polypharmacy is a factor in the patient’s disease management. Identifying the categories of medications with the highest risk for falls, combined with other patient variables such as changes in gait or vision, will lead to focused patient teaching. Fall prevention is part of health promotion and injury prevention, helping to keep older patients independent and self-sufficient in the community. Health care cost savings are substantial. Fall risk assessment related to medication use is just good nursing care.

References


