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Selected Risk Factors and Prevention of Falls among the Elderly

Wybrane czynniki ryzyka i prewencja upadków osób starszych

ABSTRACT

Falls in the elderly are a serious health problem. Among the causes of falls can be distinguished internal factors that are related to the aging process of the body and external factors, which are conditioned by the influence of the environment in which the senior lives. Falls are classified as so-called great geriatric problems. Preventive actions should be based mainly on multidirectional interventions, taking into account physical activity in particular. The aim of this article has been to analyze the fall's threat in the elderly and prevention of them.

Key words: falls, the elderly, fall prevention

STRESZCZENIE

Upadki osób starszych stanowią poważny problem zdrowotny. Wśród przyczyn upadków można wyróżnić czynniki wewnętrzne, które powiązane są z procesem starzenia się organizmu, oraz czynniki zewnętrzne, które uwarunkowane są wpływem środowiska, w którym żyje senior. Upadki zaliczane są do tzw. wielkich problemów geriatrycznych. Działania prewencyjne powinny opierać się głównie na interwencjach wielokierunkowych, uwzględniających zwłaszcza aktywność fizyczną. Celem artykułu jest analiza zagrożeń upadków osób starszych i ich profilaktyka.

Słowa kluczowe: upadki, wiek podeszły, przyczyny upadków

Introduction

The growing phenomenon of population aging implies the need to pay attention to significant health problems affecting a group of people over 65. In Poland in 2017, the average life expectancy of women living in cities was on average 81.8 years, and men 74.4 (Rutkowska 2018). One of the most serious threats to the health and life of seniors are

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falls. The World Health Organization (WHO) defines a fall as "inadvertently coming to rest on the ground, floor or other lower level, excluding intentional change in position to rest in furniture, wall or other objects" (WHO, 2007, s. 1). Falls lead to many complications, most of which include humerus fractures, part of the radius bone, spine damage / fracture, pelvic fracture, rib fractures, intracranial injuries, soft tissue damage and burns (Kamińska, 2013; Baczuk 2008). Falls are included in the group of geriatric giants, which means multiple-disease syndromes of chronic disability, whose occurrence results in the loss of autonomy and control over their own lives and/or constitutes a psychophysical, organizational and economic burden on the care system (Kamińska, 2013; Guccione 2014).

The aim

The aim of this article has been to analyze the fall's threat in the elderly and prevention of them.

Epidemiology of falls

Among people over 65, falls once a year are found in 50–67% of residents in nursing homes, 33% of older people who live alone and 20% of hospitalized people. According to statistics, every fourth person falls down in Poland every year (Buczak-Stec, Goryński, 2013). Statistics show that older people experience falls most often in their home or their immediate surroundings (80% aged 85–89) (Edbom-Kolarz, Marcinkowski, 2011). One of the most serious consequences of falling is fracture of the proximal femur that results in 14%–36% of cases, in the patient's death within a year of falling (Skalska, Wizner, Klich-Rączka, Piotrowicz, Grodzicki, 2012).

Reasons for falls

Falls are usually caused by a combination of several risk factors, that can be divided into external (environmental) and internal (associated with poor health). According to a fall prevention report published by the WHO, falls most often result from mutually interacting factors occurring in four dimensions: biological, behavioral, environmental and socioeconomic (Kamińska, 2013; WHO, 2007). Biological risk factors include age, gender and race which are classified as non-modifiable factors. The group of internal biological causes includes also age involution and therefore physiological atrophies associated with age. It may be low body weight, decreases in blood pressure, and taking some medicines. The group of external factors includes the other three dimensions. In the behavioral dimension, there are reasons for potentially modifiable falls such as alcohol abuse, lack of physical activity or activity inadequate to the motor skills, wearing inappropriate shoes and improper use of prescription drugs. Environmental factors include hazards in the homes of older people, such as slippery floors and stairs, looser rugs, insufficient lighting, poor building design and uneven sidewalks. Socioeconomic causes of falls are low income and education levels, inadequate housing, lack of social interactions and limited access to health and social services (WHO, 2007; Victorino, Chong, Pal, 2003) (Table 1).

The consequences of falls

The most common effects of falls are fractures (approximately 5%), of which half of the cases are proximal femoral fractures (Runge, Schacht, 2005). The situation is aggravated by the fact that over 50% of seniors never regain their pre-accident performance (Guccione, 2014; Runge, Schacht, 2005). Another serious consequence of falls is the fall-back syndrome, manifested by the occurrence of strong fear of falling again. Older people struggling with this ailment, stop taking any activities related to the need to leave the house, for fear of a second fall. Consequently, seniors are more likely to stay at home, their physical fitness and muscular strength decrease, which in turn increases the fear of falling or even predisposes them to another fall (Borzym, 2009; Mazur, Pisany-Syska, 2017). The euphoric syndrome affects 21-65% of people who have

Table 1. Reasons for falls (own design based on: WHO, 2007; Victorino, Chong, Pal, 2003)

Internal factors		External factors	
Biological dimension	→ **Age** → **Gender** → **Race** → **Involution**	• excess alcohol intake • lack of exercise; • improper use of prescription drugs; • inappropriate footwear.	Behav-ioural dimension
		• slippery floors and stairs; • looser rugs; • insufficient lighting; • poor building design; • uneven sidewalks.	Environmen-tal diemnsion
		• low income and education levels; • inadequate housing; • lack of social interactions; • limited access to health and social services.	Socioeconomic dimension

experienced or witnessed the fall (Borzym, 2009).

Prevention of falls

Prevention of falls usually includes activities related to improving safety in the immediate environment of the elderly, diagnosis and proper treatment of existing diseases, pharmacotherapy, implementation of exercises to improve balance and increasing the range of motion in the joints, supplying auxiliary equipment, as well as educational activities of the patient and his family (Czerwiński, Borowy, Jasiak, 2003; Saganowski, Głuchowski, 2017).

Fall prevention programs should include the following areas of intervention (Figure 1):

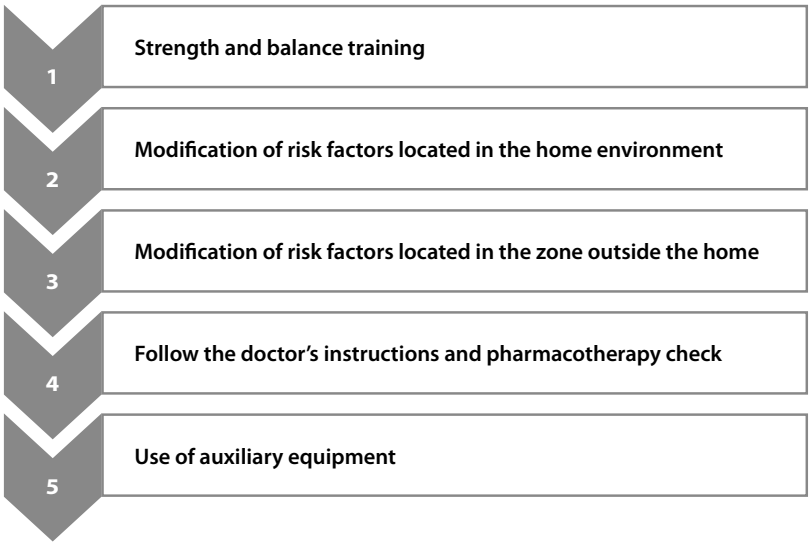

Figure 1. Areas of intervention that should include in preventive programs (own design).

1. Strength and balance training

Previous studies indicate the beneficial effect of physical activity in preventing falls. In the study Kovacs et al., which aimed at assessing the effectiveness of the program of adapted physical activity on balance, risk of falls and quality of life, it was shown that women over 60, participating in one-hour sessions of physical exercise with a physiotherapist, twice a week for 25 weeks, were 60% less likely to fall as compared to the control group, not engaging in any regular physical activity (Kovacs, Prokai, Meszaros, Gondos, 2013). The effectiveness of the fall prevention movement is also confirmed by a study conducted in Great Britain by the School of Nursing, Midwifery and Social Work. The aim of the program was to assess the impact of individualized and adapted to the group training and home exercises, to reduce the number of falls and injuries in women over 65 who have experienced a fall of 3 or more times. The study group participated in group activities aimed at improving static and dynamic balance, increasing muscle strength and body flexibility. Hours of classes with the instructor took place once a week, while exercises at home were performed twice a week for 30 minutes. In women from the study group, there was a decrease in the number of falls by 31% compared to the control group. During the 50 weeks of follow-up, the fall rate was reduced by 54% (Skelton, Dinan, Campbell, Rutherford, 2005).

Regarding the recommended type of physical activity, research indicates high effectiveness of exercise programs, which include various types of exercises in the plan (Frick, Kung, Parrish, Narrett, 2010). In multidirectional training programs, the most important are balance and muscle strength exercises, followed by endurance and stretching training (Gillespie, Robertson, Gillespie, Sherrington, Gates, Clemson, Lamb, 2012).

The research also shows that tai-chi exercises are highly effective in preventing falls (Fuzhong, Harmer, Fisher, McAuley, Chaumeton, Eckstrom, Wilson, 2005).

2. Modification of risk factors located in the home environment

In most cases, the fall occurs at home, and half of these events are caused by the slipping of an elderly person (Bartoszek A, Barańska E, Kocka K, Domżał-Drzewicka R, Łuczyk, 2015; Czerwiński, Borowy, Jasiak, 2006). In connection with the above, it is advisable to remove any unnecessary items from the house, which may pose a threat to the person staying in it. It is recommended to remove the rugs, which, by rolling up or decorations (eg tassels) pose a risk of tripping. In addition, seniors tend not to put up their feet while walking, which increases the likelihood of hooking a protruding rug. It is also necessary to install appropriate lighting that would allow the senior to move safely at night, for example towards the toilet. Also wearing proper footwear is important in the prevention of falls. It should be adjusted to the older person's feet, have adjustable buckles or velcro and a low wide heel, in order to better contact the shoes with the ground (Pighills, Torgerson, Sheldon, Drummond, Bland, 2011).

3. Modification of risk factors located in the zone outside the home

Prevention of falls should also include environmental modifications in the zone outside the apartment of seniors. It is recommended not to place advertisements on the sidewalks at the height of passersby's head and to adapt means of public transport, so that seniors could use them without any problems, for example by introducing more low-floor vehicles. It is also recommended to wear glasses with filters in order to avoid the phenomenon of glare and to improve the contrast of vision. An important element of prophylaxis of falls are activities aimed at dissemination and education in the field of technologies supporting seniors, such as seniors' bands, facilitating the call for help in the event of threat to health or life (Bujnowska-Fedak, Tomczak, 2013).

4. Follow the doctor's instructions and pharmacotherapy check

In the prevention of falls, it is very important to pay attention to cardiovascular, respiratory, nervous and sight problems among seniors. They create a risk of fainting and unconsciousness, which can lead to a fall. Neurological diseases, in which we can include paresis, states after stroke and disturbances of priocrioception may cause instability of the senior posture, and consequently, collapse (Saganowski., Głuchowski, 2017). Research also points out to the important role of physical activity in preventing deterioration of seniors' body stability (Famuła, Nowotny, Nowotny-Czupryna, Kita, Szymańska, 2012). Continuous control of drugs taken by seniors is also recommended. Improperly selected pharmacotherapy may contribute to falls of elderly people, as some medicines may cause drowsiness and dizziness. Attention should also be paid to possible interactions between medications (Pighills, Torgerson, Sheldon, Drummond, Bland, 2011).

5. Use of auxiliary equipment

An important pillar of prophylactic prevention are devices supporting the movement of seniors, such as sticks and walkers. By increasing the support base, they increase contact with the ground, and thus, improve the stability of the senior and protect him from falling. Auxiliary devices can also play an important role in reducing anxiety among older people (EUNESE, 2006).

Conclusions

Prevention of falls is one of the most important tasks of the health care system. Falling causes dangerous consequences, often leading to the death of an elderly person. They cause deterioration in the quality of life of seniors and generate high social costs. There are many risk factors for falls that can be eliminated. Preventive actions should be based on encouraging seniors to engage in physical activity adapted to the individual capabilities of the senior, and to modify the immediate environment in which the elderly person functions.

It is necessary to draw attention to the objects posing a potential threat to the elderly person and the use of facilities for seniors in the form of auxiliary equipment. The foundation of preventive activities in the field of falls should be campaigns aimed at familiarizing both elderly people and their families with risk factors of falls and possible preventive actions.

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