

Mini Review Article

Falls among hospitalized patients

Konstantina Kafantogia¹, Panagiota Katsafourou², Antonia Tassiou³, Nikoletta Vassou⁴

¹Infection Department, General Hospital of Attika "KAT", Athens, Greece; ²University Orthopaedics clinic, General Hospital of Attika "KAT", Athens, Greece; ³Vascular Surgery clinic, General Hospital of Attika "KAT", Athens, Greece; ⁴Anesthesiology Department, General Hospital of Attika "KAT", Athens, Greece

Abstract

This article presents a review of the main causes of falls among hospitalized patients, a global, cost-effective phenomenon with many complications for patients and institutions alike, with the objective of looking into fall prevention. Reviewing articles from various databases we look into data from articles with positive outcomes, published in English. Following an analysis of the main factors of in-hospital falls -intrinsic, extrinsic and exposure to risk-, we present a concise analysis of the existing fall prevention studies, focusing on the most popular risk assessing tools which seem to lead to the best results when used in combination with an integral approach from and proper communication between the patient, the family, the institution and the health-care teams.

Keywords: Falls, Hospitalized patients, In-hospital falls, Prevention and positive outcomes

Introduction

A fall according to WHO is defined as "an event which results in a person coming to rest inadvertently on the ground or floor or other lower level"¹ and is a frequent, preventable and costly problem that occurs in hospitals worldwide. The incidence of falls in the world varies depending on the studied population, but, according to studies, in the USA alone the annual estimate of falls of hospitalized patients is between 700,000.00 and 1,000,000.00². Considering the fact that inpatients' health is already affected when they are admitted in a healthcare facility, a fall can possibly lead to complications such as lacerations, fractures, subdural hematomas, bleeding, and, in some cases, death. In that way, the cost -both in healthcare and in the general outcome of the patient- is increased. Patients who fall and sustain injury are reported to have hospital charges over \$4,200.00 more than patients who do not fall³. The extension of the length of stay for the patient after a fall within the hospital setting has been estimated to be an average of 12.3 days, with a consequent increase in the average cost of 61%⁴. There are several factors contributing to the difficulty of achieving fall reduction, the most common being the ageing populations, the rising of patient awareness, the shortage of nursing staff and the ineffective work environment for caregivers⁵. However, the falls of hospitalized patients have a striking effect on healthcare, due to the fact that it is a fact closely related to the quality of care and patient safety, representing a very important field that has to be addressed

in a comprehensive and cost-effective way.

Fall prevention can be achieved with the integration of factors such as optimal use of the hospital environment, constant evaluation and reevaluation of errors and practices that have proven effective, as well as good communication between healthcare providers in a comprehensive hospital care program, quantifying the risk of particular triggering events for falls and analyzing the action taken to mitigate this risk⁶. Based on their understanding of patient, family, and system priorities, the nursing staff is well positioned to assume direct care and leadership roles⁷. Their role as a primary caregiver, care manager, decision maker and patient and family communicator puts them in the forefront of patient evaluation and fall prevention.

Method

A detailed review of the existing literature on the issue of falls among hospitalized patients was carried out in various

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Corresponding author: Konstantina Kafantogia, 12-14, Alfeiou Str, 115 21, Athens, Greece

E-mail: kkafad@yahoo.gr

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electronic databases (Medline/PubMed) with the use of the key words: falls, hospitalized patients, in-hospital falls, and prevention. Data reflecting encouraging outcomes on patient fall prevention methods were gathered from online publications, articles, studies, meta-analyses and reviews internationally. The articles reviewed were from 1989 to 2017 and were all in English. Of the 648 references identified in our search, 19 met our main inclusion criteria which were the integral approach to the subject of patient falls -some in combination with positive outcomes- with no exclusion criteria.

Main factors of in-hospital falls

In general, falls are grouped into three wide-ranging categories: anticipated physiological falls, unanticipated physiological falls and accidental falls⁹. The anticipated physiological falls are generally attributed to age, illness, medications, medical procedures or exams and can be predicted in risk assessments. They are the most common, amounting to 78% of the falls⁹. The unanticipated physiological falls are attributed to factors relating to physiology, but are considered unpredicted due to the fact that the patients in this category had not been identified in standard risk assessments. Finally, the accidental falls involve patients who are not in danger of falling but actually fall because of problems relating to an operation or the environment of the healthcare facility, and represent the second most common group accounting for 14% of in-hospital falls¹⁰. What becomes evident from these numbers is that most cases involve cases where the risk could be predicted and thus prevented. This review mainly focuses on anticipated physiological falls because they form the largest category, and can be prevented if the necessary precautions and measures are taken. Additionally, careful monitoring of the risk groups can lead to a reduction in falls using a minimum of resources and cost. The anticipated physiological falls can be attributed to either intrinsic factors, extrinsic factors, and exposure to risk¹¹.

Intrinsic fall factors

The intrinsic fall factors involve features relating to the overall physical shape or the level of incapability the patient has at the moment of admission into a healthcare facility. These, generally relate to issues such as balance, age, gender and ethnicity¹¹, previous injurious falls, acute illness, vision problems¹², nutritional deficiencies¹¹. More particularly, lower extremity weakness, history of falls, gait or balance problems, use of assistive devices, arthritis, foot problems depression, chronic illness, orthostatic hypotension, urinary incontinence, polypharmacy, mental/cognitive deficit, hyponatremia¹³, antidepressants, antipsychotics, diuretics, hypoglycemics, laxatives, non-steroidal anti-inflammatory agents, sedatives/hypnotics are all intrinsic factors associated with in-patient falls.

The intrinsic risk factors can easily be checked when the

patient's history is taken upon admission to the hospital and can consequently set in motion preventive actions that, in most cases, can minimize the risk of falls for them. The main problem when trying to reduce the risk of falling for these patients is the lack of established operating procedures when a patient is identified as being at risk for falling and miscommunication or complete lack of communication among the various health providers that deal with the patient. The hospitals that have systems whereby communication is improved and standard operation procedures have been established have provided significant results in the reduction of falls, in some cases in numbers over 60%¹⁴.

Extrinsic fall factors

The category of extrinsic fall factors involves environmental factors such as poor lighting in the room, toilet or corridors, poor condition of flooring surfaces or slippery floors, inappropriate footwear^{11,15} and clothing. This category also features inappropriate walking aids or assistive devices¹¹ such as the height of the bed and whether there are raised rails or not, the height of chairs, the lack of grab bars in the toilet or in the bath as well as their improper use. Even though these factors cannot be directly linked to any specific patient, they can function as aggravating factors that add on the risk posed by intrinsic factors, acquiring a significant role in the overall risk profile of the patient⁸.

Exposure to risk

According to studies, there is an intricate relationship between falls, activity and risk, suggesting that the people who are most active and those most inactive are more prone to falling¹¹. The type of problem faced by the patient is in close relation to his/her intrinsic risk factors. Therefore physical activity may increase the risk of falling for some patients or reduce it for others, increasing the risk of suffering a serious injury¹¹. The adjustment of activities with the aim of reducing exposure to risk may prove beneficial, as long as an individualized and delicate balance is struck between risk reduction and maintenance of quality of life and independence.

It becomes clear that the reduction of extrinsic risk factors as well as exposure to risk play a very important role in the reduction of in-hospital falls. Even though the elimination of these factors can help the reduction of falls, no in-depth studies have been carried out in order to quantify the level of reduction, due to the fact that it is not possible to link them to groups of patients at risk, in contrast to studies involving intrinsic risk factors¹⁵.

Analysis of existing fall-prevention studies

Generally, the results of studies regarding fall prevention in institutions that have established fall prevention programs have been inconclusive, with some studies showing insignificant rates of reduction in the overall rate of falls, while others vary significantly as to the levels of reduction. Moreover, the evaluation of the success of

a program was difficult due to sparse documentation, statistical heterogeneity¹⁶ and different focus of the studies, i.e. number of falls per patient years or occurrence of patient complications due to falls in institutions which had established fall prevention programs¹⁷.

An overview of several different studies and systematic meta-analyses shows that one of the most important features leading to a reduction of falls in healthcare institutions is the utilization of patient risk assessment tools. The mere existence of risk assessment programs seems to be a key factor in the reduction of falls of in-hospital patients since it allows the healthcare providers to provide the at-risk patients with extra attention, a fact that resulted in a reduction at the rate of falls by approximately 20%¹⁷. In general, the combination of risk assessment programs with effective communication within the caregivers in a facility and standard procedures for the management of patients at risk of falls, shows a significant reduction in the risk of falls.

Widely-used risk assessing tools

The risk assessment tools constitute the key element of any fall-prevention program due to the fact that they help the healthcare team focus their attention on the patients at high risk of falling, making use of a more productive use of the institution's resources. In general, the process of risk assessment includes scoring the patient with several scales in order to identify the ones at high risk of falling. The two more widely used scales are the Morse Fall Scale (MFS)¹⁷ and the St. Thomas Risk Assessment Tool in Falling (STRATIFY)¹⁸. Even though there are several other scales¹⁹, the present review focuses only on the Morse fall scale and the STRATIFY scale because they seem to be the ones more widely utilized in healthcare institutions²⁰⁻²².

The MFS is a quick and easy method of assessing a patient's likelihood of falling²⁰, and the most widely used scale in terms of risk assessment. A large majority of nurses (82.9%) rate the scale as "quick and easy to use," and 54% estimated that it took less than 3 minutes to rate a patient. It consists of six variables: the patient's previous history of falls, the number of additional diagnoses, the use of ambulatory aid, whether the patient undergoes intravenous therapy, his/her gait and mental status²². These variables are quick and easy to score, and it has been shown to predict relatively accurately the risk of fall²³, basically listing the various intrinsic factors associated with the patient that might lead to falls.

The STRATIFY is the second widely used scale for the identification -and consequently- prevention of falls among -mainly elderly- hospitalized patients. The STRATIFY characteristics include history of falls, mental impairment, visual impairment, toileting, and dependency in transfers and mobility. Although the focus is elderly patients, the analyses results point to greater statistical accuracy for the prediction of risk of falls in third age groups, while providing relative statistical specificity²⁴.

After the extraction of the scores of the scales, the patients are categorized into one of three categories, low, medium and high fall risk, offering the caregivers the opportunity to determine the kind of care the patient should have. An important factor for the achievement of optimal results is the communication of the results to the entire care provider team or the entry of the data into a central system whereby they can be reached and processed by different departments. It should be noted that the appropriate cut-points to distinguish risk should be determined by each institution based on the risk profile of its patients²⁵. Furthermore, the abovementioned scales do not take into account the extrinsic environmental and operational factors, and a process of calibration should be performed in order to cover the risk factors particular to specific wards. Several factors to be taken into account include the need of an individual patient to move, the overall lighting of the facility, the presence of obstacles, etc. For example, patients who are admitted to medical-surgical and long-term and palliative care services, would have a different cut-point from an orthopedic ward. The cut-off points of the scale must be studied in each specific context, since they are not mere theoretical details, but rather data with real implications for nursing practice, the overall patient outcome as well as the management of a major healthcare problem²⁶.

Best practices results

With the extraction and evaluation of the fall risk score relating to individual patients there is a need for the implementation of a standard operating procedure so that the patient's treatment is consistent and integrative. Furthermore, the extrinsic factors and the exposure to risk have to be identified and dealt with to reduce the possibility of the hospital setting posing a risk. The successful procedures implemented by major healthcare institutions can set an example providing guidelines for further successes in the field of in-hospital fall prevention.

The hospital setting, though not directly linked to the patient's intrinsic fall risk, should be clutter and obstacle-free and well lit in all the areas the patient will use. All the support devices such as handholds, bed and side rails should be in place, maintained carefully and within easy reach of the patient. The furniture can also be positioned within easy access of the patient. These preventive measures can help in the prevention of both anticipated, as well as unanticipated falls.

Several areas can undergo a reform to help in the reduction of the numbers of falls. More specifically, cognitively impaired patients who are agitated or trying to wander can be closely supervised and have their medication reviewed, since medications can both contribute to agitation as well as keep patients calm. Patients with frequent toileting needs should be taken to the toilet on a regular basis, via a scheduled rounding protocol. Patients with visual impairment could have corrective lenses easily within reach²⁰.

The assistive devices and ambulatory aids is one of the easiest areas to manage. Medium to high-risk patients can be instructed on the proper use of the assistive devices and on how to ask for assistance with the placement of call buttons within easy reach of the area the patient will spend a significant amount of time. If patients bring their assistive devices from home, staff can make sure these devices are safe for use in the hospital environment. Even with assistive devices, patients may need help from staff for mobility or can be provided with slip resistant footwear²⁰.

The patients on high risk medications should have the medication frequently reviewed with fall risk in mind. The healthcare provider should follow recommendations for dose adjustment, discontinuation or substitution if the patient is categorized as high risk for falls. A productive communication method should be implemented and all members of the treating team should be aware of a patient on high risk medication, a procedure that has shown positive results in fall prevention. Last but not least, the patient himself and his family should be informed and educated on fall risk in connection to medication and actively work with the healthcare team to prevent falls²⁰.

The lack of patient and family education regarding the treatment plan and the risks involved is also an area where intervention could prove beneficial to the prevention of falls of hospitalized patients. Patient and family education involves comprehensive information from the healthcare team on treatment plan, intrinsic risks and suggestions on ways to prevent falls. It is a valuable tool, since it has been shown that most falls happen when the nursing staff is not present, during visiting hours. The informed family and friends can take over the monitoring of the patient, thus preventing falls¹⁵.

One of the most important procedures that seems to play a key role is the post-fall analysis, which can help the care team extract valuable data and break it down by nursing unit to find trends and links between falls and factors specific to wards. The regular and in-depth reviews of post-fall analysis data can help the care team pinpoint factors, assess them, locate additional factors missing from the initial assessment of the patient. In this way the flaws in the implemented processes can be found and corrected, and staff education to heighten awareness can be kickstarted²⁷.

The review of post-fall analyses also educates the healthcare providers on acknowledging their responsibilities, the foremost being the proper communication on the patient-specific needs to both the patients and the other healthcare providers²⁷. It also highlights the need for close collaboration and creates a team spirit mentality that is in stark contrast to the mentality of separate teams working on a patient, blaming and shaming the nursing teams for non-achievement of zero-fall goals and focusing on administrative goals rather than patient safety²⁸.

All the successful practices examined here achieved their goals due to the fact that the institutions that implemented

them had procedures incorporating the evaluation and review of standard methods, post-fall analyses and improvements, as well as a robust culture of safety.

Conclusions

The in-hospital falls is a global phenomenon that accounts for many complications for patients whose health has already been compromised upon admission. Most of the falls are anticipated and thus preventable, and successful standard prevention procedures feature common factor evaluation, with the use of assessment scales for the determination of high fall risk patients. The results of the best practices point to the fact that the elimination of environmental factors, the provision of assistive devices, the review of the patient's medication, the proper communication between the health care teams and family as well as the constant review of post-fall analyses in combination with the assessment of factors relating to specific institutions can lead to significant reduction of in-hospital falls.

The health care and nursing teams play a most important role in the overall prevention of falls, since they are the individuals who interact with patients the most. Thus, for the implementation of any successful program, the teams must be given the proper training to recognize patients who are at risk of falling and the autonomy to implement and assess the benefits of different and individualized preventative measures with the use of information technology systems and tools. Then, working alongside all teams responsible for the treatment of the patient as well as the administration, they can bring about positive outcomes. In order to achieve this coordination, an organizational culture and operational practices that promote teamwork and communication, as well as individual expertise are required²⁰. This is the only way to implement a comprehensive culture of safety in a hospital and for a systemic reduction of falls.

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