

Investigation of the Causes and Ways of Reducing Injuries in Age-Related Patients with Multimorbidity

Lada A. Ratushnaya¹, Diana G. Gabelaia², Sofia M. Petrova³, Tatiana V. Maksimenko⁴,
Sergey V. Barinov⁵, Alexander Anatolevich Markov^{*6,7}

¹Novosibirsk State Medical University Krasny prospekt 52630091

²FSBEI HE Astrakhan SMU MOH RF 414000, Astrakhan. Bakinskaya str. 121

³Pavlov First Saint Petersburg State Medical University, 197022

⁴Sechenov First Moscow State Medical University (Sechenov University) Moscow, Russia, 119991, Trubetskaya 8-2, Russian Federation

⁵Moscow State University of Civil Engineering, Moscow, Russia

⁶Tyumen State Medical University, Tyumen, Russian Federation

⁷Tyumen Industrial University, Tyumen, Russian Federation

ABSTRACT

The article investigates the causes and ways to reduce injuries in age-related patients with multimorbidity. The author points out that Multimorbid people are at significant risk of falls. These results require prioritization of falls as a public health problem with the need to integrate falls into existing geriatric healthcare programs. The combination of multimorbidity and proximal fracture leads to an increase in mortality, which strongly indicates the need for more comprehensive approaches to high-risk patients. Accordingly, there is a need for future research on the care of high-risk patients after a fracture and the study of the relationship between multimorbid clusters and other signaling events in the field of healthcare.

Corresponding Author e-mail: alexdoktor@inbox.ru

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INTRODUCTION

Due to demographic changes and advances in healthcare, there is a significant increase in the aging population. Forecasts show that by 2050 the population of elderly people aged ≥ 60 years may double.¹

Falling is one of the main causes of injuries and a little-recognized public health problem among the elderly. About one third of adults aged ≥ 65 years fall at least once every year.² Falls are the cause of 10 to 15% of all visits to intensive care facilities and they are the main cause of 20 to 30% of injuries from mild to severe with more than 50% of injury-related hospitalization among people aged 65 years and older.³

The main clinical conditions for hospitalizations associated with a fall are hip fractures, traumatic brain injury and upper limb injuries. The available data indicate that the period of hospitalization after fall-related injuries ranges from four to fifteen days and can be extended if it is associated with weakness, hip fractures and old age.⁴ From 30% to 55% of adults aged 60 years and older are afraid of falling, and more than 30% report limiting their daily activity.⁵

Multimorbidity is the simultaneous presence of two or more chronic diseases. As the world's population ages, polymorbidity is becoming more common; approximately 65% of patients aged 65 years and older and 80% of patients aged 85 years and older have at least 2 chronic diseases. Most current disease management guidelines have limited applicability to this high-risk group because they are based on randomized clinical trials that usually exclude individuals with multimorbidity. Consequently, there is insufficient data on optimal care for people with multimorbidity. Identifying distinct and reliable clusters of chronic health conditions that are often combined with each other is a logical step to meet this need.

Studies show that people aged 60 years and older with multiple anomalies are at greater risk of falls than others.⁶

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Decrepitude is not a direct natural consequence of aging. Rather, it is usually the result of the intersection of age-related deterioration with chronic diseases and conditions. This is associated with adverse outcomes such as institutionalization, falls and deterioration of health. More and more evidence suggests that weakness should be a key factor both in treatment planning and in preventing adverse outcomes. The prevalence of elderly patients with injuries is increasing, and the main cause is low-energy trauma (that is, falling from the ground or from a low height, which are typical for weakened patients).⁷

Failure to detect weakness potentially exposes patients to interventions that may not benefit them, and may even harm them. In addition, it is unacceptable to assume that there is no weakness in the patient, only on the basis of the age. The future task is to move to a new clinical paradigm characterized by more adequate, targeted care for weakened patients.

Chronic age-related diseases often lead to sensitivity deficits and mobility problems, which can increase the likelihood of falling.⁸ Gait, the use of walking assistive devices, dizziness, conditions such as Parkinson's disease, polypragmasia associated with multimorbidity may be the main risk factors for falls among the elderly. The study of the causes and consequences of injuries of elderly people can help to strengthen geriatric care and further improve the quality of life among this group. In addition, it will make it possible to make changes to existing health programs and future policies regarding the aging population.

MATERIALS AND METHODS

In the course of the study, materials devoted to the study of the problem under consideration were studied, comparative and analytical research methods were used in the processing of the data obtained.

RESULTS

Senile weakness is characterized by a decrease in the functioning of many physiological systems, accompanied by increased vulnerability to stressors, and is becoming increasingly common as a result of global population aging.

Although the global burden and prevalence of senility are not well known, some general patterns have emerged: it is more common in women than in men, increases with age (although it is present in all age groups) and is more common in lower social groups. -economic groups and ethnic minorities. There is more and more data on the impact of weakness in the intensive care unit and after severe brain damage. Fragility is associated with higher mortality in elderly patients and is associated with a wide range of "geriatric conditions" such as dementia, cognitive decline, disability, falls, fractures, loneliness, impaired mobility, decreased quality of life, hospitalization and dependence on home care.⁹

Weakness by definition is a multidimensional state. Unsurprisingly, a variety of tools have been developed to measure it, including objective assessments, self-reports, performance assessments, or combinations thereof. Despite the fact that they are numerous, they are usually divided into two general models. The first model considers weakness as a biological syndrome

identified as a separate phenotype. The Cardiovascular Health Research Index is the most widely cited example of this model. It quantifies deficits in five areas, with weakness defined as the presence of deficits in at least three of them. The second model, or cumulative deficiency method, identifies weakness by listing health disorders; in this case, less attention is paid to the specifics or severity of each problem. Based on this concept, experts have developed a cumulative deficit weakness tool or weakness index.¹⁰

The initial weakness index includes clinical features, functional characteristics and laboratory indicators that are known to be associated with the development of adverse outcomes. It is important to note that this is a multidimensional construction, and not just a measure of multimorbidity. Deficits in its elements are calculated, and then the index of weakness is determined by counting the number of deficits present from the measured number.

The researchers also argue that the principle of measuring weakness should be in calculating health deficits, the rationale for which is that the more deficits a person has, the more likely that person is to be weak. Although the number of elements included in the weakness index (symptoms, signs, diseases, disability, laboratory, radiological or electrocardiographic abnormalities) may vary, it is important to include a sufficient number of elements to provide accurate estimates: indeed, "estimates are unstable when the number of deficits is small - about 10 or less".¹¹

The literature contains prognostic validity data for indicators of cumulative deficiency of weakness index indicators in the general population, diagnostically specific populations (HIV, systemic lupus erythematosus, metabolic syndrome, survivors of myocardial infarction, childhood cancer, chronic renal failure or end-stage renal failure) and surgical populations (hematopoietic cell transplantation or other unspecified surgery).¹²

Elderly people who have been diagnosed with senile weakness are often susceptible to various injuries. It is known that injury often results from a fall. Falling is a multifactorial and interrelated health condition, most common among the elderly. However, the number of studies of falls and their relationship to polymorbidity is limited. Experts from India assessed the relationship between falling and multimorbidity among Indians aged ≥ 60 years. He concluded that the prevalence of falls is about 12.5% with a slight predisposition among women. Rural residents, higher economic status and polymorbidity were different predictors of the decline.¹³

The prevalence of falls in the above study was 12.5%, which is lower than in the study conducted among adults in South Korea (15.9%).¹⁴ However, the number of falls is still a serious problem for the elderly. In addition, falls lead to the development of fear of falling in older people, which may force them to limit their daily activities. The consequence of this situation may be a decrease in physical activity, the emergence of social isolation and depression, thus a vicious circle arises, further increasing the risk of falls.

The reason for the differences in the prevalence of falls depending on gender may be associated with a decrease in bone mass and a weakening of the quadriceps muscle, especially

after menopause in women, which obliges the traumatologists to individually select modern and innovative metal structures for surgical treatment.¹⁵⁻¹⁷

Researchers also believe that falls are largely associated with hearing defects. In addition, falls are associated with diabetes, depression and visual impairment. Among traumatized elderly people, 51.1% had multimorbidity.¹⁸

Various mechanisms underlying falls can be complex and multifactorial, for example, eye diseases (cataracts and glaucoma), depression and taking antidepressants, skeletal muscle dysfunction, balance deficiency, restriction of daily activity, postural fluctuations and gait. Multimorbidity can reduce physical activity, exacerbate disability and reduce adherence to treatment, paving the way for a fall.

Fractures provide an informative environment for studying outcomes associated with multimorbidity. Half of patients with fractures have at least 2 concomitant diseases. The contribution of polymorbidity to mortality after hip fracture is well illustrated by chronic obstructive pulmonary disease. Patients with hip fracture and without chronic obstructive pulmonary disease had an associated 3-fold increased risk of mortality, whereas patients with chronic obstructive pulmonary disease had a 6-fold increased risk compared to the control group without any diseases.

Less is known about the relationship between multimorbidity and non-hip fractures, which may have an even greater population association with mortality risk. The identification of separate clusters of coexisting chronic diseases that are associated with the risk of death after a fracture would facilitate the provision of individual care. In addition, weakness is associated with a higher level of serious complications and, consequently, with the need to be discharged to rehabilitation centers or other special institutions. Specialists found that even weakened patients who did not need hospitalization in the ICU and were discharged alive needed a long period of inpatient rehabilitation.

It was also determined that in hospitalized weakened patients with trauma, unplanned hospitalization in the intensive care unit strongly correlates with age and more pronounced weakness. According to the literature, geriatric patients with injuries are also more prone to nosocomial complications, such as unplanned intubation, infections, deep vein thrombosis, sepsis. The fact that cardiac and respiratory complications were the most common causes of "coming back to normal" suggests that weakened geriatric patients discharged from intensive care units may require a higher level of care. In a retrospective review, repeated hospitalization of octogenarian patients after a fall directly correlated with mortality after 6 months. Anticoagulants had no effect on mortality, confirming weakness as a stronger predictor of readmission and mortality. It has been shown that polypragmasia (the use of several anticoagulants or antithrombotic drugs) is associated with developing lesions during computed tomography, more extensive extracranial lesions, hemorrhagic progression and delayed intracranial hemorrhage without correlation with adverse functional and clinical outcomes. Weak patients are more likely to require hospitalization; they are also more prone to adverse events and, consequently, face the prospect

of persistent post-traumatic disorders that reduce their quality of life. Moreover, elderly people after injuries have a higher probability of an unfavorable outcome, which is due to pre-traumatic health and age.¹⁹

The association of multimorbidity with the risk of death is significant and specific both for the fracture site and for the cluster of multimorbidity. It is important to note that the combination of specific multimorbid clusters and fractures already associated with increased mortality has led to an aggravation of the risk of mortality.

DISCUSSION

The identification of multimorbid clusters for individual diseases makes it possible to focus the future development of guidelines, as well as natural science and mechanistic studies of the interaction of multimorbid clusters with specific conditions. These ideas can lead to a transition from an approach to the treatment of a single disease to individual management, taking into account specific profiles of multimorbidity. It has already been noted that the coexistence of chronic diseases can make a very high risk of heart failure with a reduced ejection fraction much more obvious in clinical practice, which may lead to a better prioritization of preventive measures. The identification of a specific cluster of polymorbidity also provides additional information about other comorbidities, helping doctors to take into account the patient's health goals, thereby aligning treatment options with these goals.

For example, goals for the health outcomes of a patient from a diabetic cluster should be formulated taking into account not only diabetes, but also cardiovascular and chronic kidney diseases, which usually coexist in the cluster. In addition, the differences between patients from the cluster with low multimorbidity and diabetes and patients from the diabetic cluster also help to understand the conflicting data on the association of diabetes with fractures.

Although patients with uncomplicated diabetes and good control may have a risk of death after a fracture similar to the risk of mortality in the general population, patients with advanced disease may be uniquely vulnerable after a fracture and thus benefit from a more aggressive approach to fracture prevention. The ability to identify elderly people from trauma risk groups currently depends on existing assessment tools, but there is an obvious need to determine the appropriate gold standard associated with this activity. Intervention at the prevention level to reduce the prevalence or severity of senility can be of great benefit to patients, as it will reduce injuries among this population group.

Recent publications devoted, in particular, to geriatric patients with injuries also emphasize the importance of providing an additional level of care for weakened patients discharged from intensive care units, not only to reduce repeated hospitalizations and complications, but also to improve functional outcomes and reduce injuries.²⁰

Cognitive telerehabilitation, performed at the pre-discharge stage in order to ensure a higher level of commitment to home telotherapy and potentially better results, has proved to be a promising new tool for cognitive training in the case of potential injury in multimorbid patients.

Interventions should be combined in multidisciplinary treatment to obtain the best results in weakened patients.

Researchers point to the need to develop targeted programs for the care of the infirm. For example, it may be useful to be able to discharge debilitated multimorbid patients to nursing facilities (or other facilities), focusing on an individual rehabilitation model that takes into account age, weakness and concomitant diseases to achieve better long-term results. **Conclusion.** The combination of multimorbidity and proximal fracture leads to an increase in mortality, which strongly indicates the need for more comprehensive approaches to high-risk patients. Accordingly, there is a need for future research on the care of high-risk patients after a fracture and the study of the relationship between multimorbid clusters and other signaling events in the field of healthcare.

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