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Nursing Care of Frail Patients in Cardiac Surgery

Kalp Cerrahisinde Kırılgan Hastaların Hemşirelik Bakımı

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ABSTRACT

Although there is no standardized definition of frailty, it is a geriatric syndrome conceptualized as a decrease in physiological reserves due to aging. Frailty may occur as a result of cardiovascular diseases, and it is also a predictive indicator for the development and progression of cardiovascular diseases. In epidemiological studies, the prevalence of frailty was determined to be higher in cardiac surgery patients than in other surgical patients. In addition, frailty has been associated with many adverse health outcomes such as delirium, mortality, and morbidity following cardiac surgery. With advanced evaluations to determine preoperative frailty in patients who are candidates for cardiac surgery, adverse events that might occur following surgery could be predicted, and necessary measures could be taken. Management of frailty is multidisciplinary and multidimensional. It is significant to recognise the concept of frailty, its assesment tools, and its pathophysiology for the management of frail patients with frailty and proposed to undergo cardiac surgery. This review discusses the concept of frailty, its evaluation, pathophysiology, epidemiology in cardiac surgery, effect on patient outcomes, importance of its evaluation, and nursing care for this condition.

Keywords: Cardiac Surgical Procedures, Frailty, Nursing Care.

ÖZ

Kırılganlığın standartlaştırılmış bir tanımı olmamasına rağmen yaşlanmaya bağlı fizyolojik rezervlerin azalması olarak kavramsallaştırılmış bir geriatrik sendromdur. Kırılganlık kardiyovasküler hastalıklar sonucu ortaya çıkabildiği gibi kardiyovasküler hastalıkların gelişmesi ve ilerlemesi açısından da öngördürücü bir göstergedir. Epidemiyolojik çalışmalarda kırılganlık prevelansının diğer cerrahi hastalara oranla kalp cerrahisi hastalarında daha yüksek oranda olduğu saptanmıştır. Ayrıca kırılganlık kalp cerrahisi sonrası delirium, mortalite ve morbidite gibi birçok olumsuz sağlık sonuçları ile ilişkilendirilmiştir. Kalp cerrahisi adayı hastalarda ameliyat öncesi kırılganlığın değerlendirildiği ileri değerlendirmeler ile ameliyat sonrası ortaya çıkabilecek istenmeyen olaylar öngörülebilir ve gerekli önlemler alınabilir. Kırılganlığın yönetimi multidisipliner ve çok boyutludur. Kırılgan kalp cerrahisi hastalarının yönetimi için kırılganlık kavramının, ölçüm araçlarının, patofizyolojisinin anlaşılması önemlidir. Bu derlemede kırılganlık kavramı, kırılganlığın değerlendirilmesi, patofizyolojisi, kalp cerrahisinde kırılganlığın epidemiyolojisi, hasta sonuçları üzerine etkisi, kırılganlığın değerlendirilmesinin önemi ve hemşirelik bakımına yer verilmiştir.

Anahtar Kelimeler: Kalp Cerrahisi Ameliyatları, Kırılganlık, Hemşirelik Bakımı.

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INTRODUCTION

The number of elderly people is gradually growing globally due to increase in life expectancy. It is expected that the population aged ≥60 years will almost double from 12% to 22% between 2015 and 2050.[1] With the increase in the elderly population and widening of treatment options, the number of elderly patients who are candidate for surgery is gradually increasing. Most of these patients are frail patients with reduced physiological reserves when faced with stressors. Frailty has become an significant issue affecting the surgical process as the average age of patients and number of complications have rose and as treatment alternatives for cardiac diseases vary from drug therapy to minimally invasive procedures and cardiac surgery.[2,3]

Frailty includes many conditions such as malnutrition, requirement of prolonged bed rest, pressure injuries, gait disturbances, weakness, loss of motivation, loss of strength, balance disorder, delirium, confusion, and memory problems, which are signs of biological aging.[3] As cardiovascular diseases and frailty have a common biological pathway, cardiovascular diseases might speed up the progression of frailty.[4] Frailty might occur as a result of cardiovascular diseases, and it is also a predictive indicator for the development and progression of cardiovascular diseases.[2]

If further evaluations are performed, including the assessment of frailty in candidates for cardiac surgery, adverse events that might occur in the short and long term postsurgery can be predicted, and necessary measures can be taken.[2] Identifying patients with frailty and performing appropriate interventions are crucial, as these factors affect the quality of life of patients as well as cause additional burden to the health system. Therefore, patients should be evaluated in a holistic manner using a multidisciplinary approach, and appropriate follow-up and treatment planning should be conducted.[3]

The number of studies on the optimal clinical management of frail patients who are cardiac surgery candidates is limited in the literatüre.[3,5] It is crucial to understand the concept of frailty to ensure proper patient management in cardiac surgery. In this review, the concept of frailty and its evaluation, pathophysiology, epidemiology in cardiac surgery, effect on patient outcomes, importance of evaluating it, and nursing care for cases of frailty are discussed.

Concept of Frailty

The term “frail” is used to define patients who are “the weakest and the most vulnerable.” There are multiple definitions in the literature regarding frailty. Frailty syndrome refers to the decrease in physiological reserves, which play a role in the efficiency of performing daily activities and response to stress, as a result of the decline of multiple organ and system functions due to biological aging. This syndrome has been mainly considered in the elderly population; however, it is related to the biological age of the person rather than the chronological age.[6] Frailty in geriatrics is defined as “a reduced ability to maintain or restore homeostasis after an event that disrupts balance, a geriatric syndrome characterized as extreme vulnerability to stress”.[7] Based on international consensus the term frailty is described as “a medical syndrome with multiple causes and contributors that is characterized by diminished strength, endurance, and reduced physiologic function that increases an individual’s vulnerability for developing increased dependency and/or death.”.[8] The term frailty does not have a standardized definition.

Evaluation of Frailty

It is very difficult to quantify frailty, as it is a clinical condition that depends on many variables. Since the level of frailty is independent of age, it is necessary to use not only age but also different objective scales. In a study, 67 different frailty tools were identified, covering varying areas and

criteria, depending on the purpose of use.[9] In a systematic review by De Vries (2011), factors associated with frailty and the most widely used measurement parameters were examined.[10] Eight factors associated with frailty are presented in Table 1:

Table 1. Factors Associated with Frailty and Measurement Parameters Used[10]

Factor associated with frailty	Parameters used in measurement
Mobility	-Walking without support -Gait speed
Physical activity	-Physical activity level -Leisure time physical (group) activity
Energy	-Tiredness -Working capacity
Nutritional status	-Appetite -Weight loss -Body mass index
Strength	->5 kg weight lifting -Weakness in the arms/legs -Climbing stairs -Grip strength with hand dynamotor -Calf muscle circumference
Mood	-Sadness -Nervousness -Depression/depressed mood -Anxiety
Cognitive function	-Memory problems -Dementia or cognitive impairment
Social relationships/social support	-Having someone to help when needed

The scales used to determine vulnerability in the literature are often based on two models. The first of these is the frail phenotype model developed by Fried et al. (2001) in the Cardiovascular Health Study, and the second one is the frailty index model based on the deficit accumulation created by the Canadian Study of Health and Aging (CSHA).[6,11]

According to the phenotype model developed by Fried et al. (2001), frailty is defined as having three or more of the following parameters: slow walking speed, unintented weight loss, exhaustion, weakened muscle strength, and decreased physical activity.[6] The condition with the presence of one or two of these parameters is defined as pre-frail. It is observed that the Fried Scale is commonly used in studies evaluating frailty in cardiovascular diseases.[2,12,13]

A deficit accumulation model was developed with the data from CSHA, and the CSHA Frailty Scale was developed by including 92 basic variables such as signs, disease states, disabilities, symptoms, and abnormal laboratory values. In this scale, possible frailty is evaluated by the accumulation of deficits in patients. It is stated that the more deficits the individuals have, the frailer they are. In this scale, the frailty model is adopted, which supports the idea that homeostatic reserves decreases with age. With this model, the degree of frailty is also evaluated. Later, 92 variables in the scale were simplified as 36 variables.[11]

Furthermore to these extensively used measurements, some researchers have reduced the characteristic of frailty to one parameter measurements (e. g. walking speed or hand grip strength) or combined measurements derived by previous researchers.[14,15] The existence of these alternative approaches indicates that there is no standardized measurement method for measuring frailty.[2,3]

The tools that are frequently used in the measurement of frailty are presented below:

- Fried Frailty Scale
- Rockwood Frailty Index
- Osteoporotic Fractures Index
- Edmonton Frailty Scale
- FRAIL Scale
- Clinical Frailty Scale
- Tilburg Frailty Scale

The scales for which Turkish validity and reliability studies were conducted are as follows: Tilburg Frailty Scale, Edmonton Frailty Scale and FRAIL Scale.[16]

Pathophysiology of Frailty

Frailty is believed to be caused by the dysregulation of the immune, metabolic and endocrine systems.[17] It is assumed that the basis for this dysregulation, and ultimately

frailty, is caused by molecular changes due to aging, genetics, chronic environmental exposures, and specific disease states.[7]

Normal aging and frailty have similar processes. Although apoptotic and cellular changes are more common in normal aging, changes in frailty particularly include dysfunction in muscle activity and energy metabolism.[3,5] Sarcopenia is an important physiological component of frailty. It been demonstrated that decreases in skeletal muscle function and mass are the result of changes in inflammatory pathways, including an increase in inflammatory cytokines and age-related hormonal changes.[17]

There are direct biological links between chronic exposure to inflammatory mediators and pathophysiological tissue changes consistent with frailty. The proinflammatory cytokine interleukin-6, C-reactive protein, monocyte and leukocyte counts are high in elderly adults with frailty living in the community. It is believed that the elevation in the levels of biomarkers worsen physical performance and walking speed. In addition, interleukin-6 affects negatively skeletal muscle and adaptive immune system function, cognition, and appetite and leads to anemia. Activation of the immune system can trigger the coagulation cascade through the relationship demonstrated between frailty and coagulation markers (fibrinogen, D-dimer and factor VIII). Furthermore, it is believed that elderly adults with frailty are less likely to generate an sufficient immune response against the flu vaccine.[17]

Multiple endocrine system changes have been associated with frailty. Decrease in "growth hormone dehydroepiandrosterone sulfate", "insulin-like growth factor-1", "25-hydroxy-vitamin D", "sex steroid levels", and increase in "cortisol levels" have been associated with frailty.[17]

Further, stress response and changes in metabolic systems have been associated with frailty. Altered glucose metabolism and autonomous nervous system dysregulation are factors that affect the development of frailty. Age-related changes in the mitochondria and renin–angiotensin system affect sarcopenia and inflammation, which are important elements of frailty.[17] The factors belived that cause the development of frailty are summarized in Figure 1:

Epidemiology of Frailty in Cardiac Surgery

Numerous epidemiological studies have been conducted using different frailty measurement tools. The prevalence of frailty changes based on the assessment tools used to describe frailty and the population studied. In longitudinal cohort studies, the prevalence of frailty in the population living in the community is determined to be <10%.[6] However, the prevalence is quite high in important patient subgroups. The prevalence of frailty among patients with cardiovascular diseases has been determined to be in the range of 10%–60%.[4] Furthermore, this rate in patients undergoing cardiac surgery is between 20% and 50% and is higher than that in patients undergoing non-cardiac surgeries.[18,19]

Effect of Frailty on Patient Outcomes in Cardiac Surgery

Frailty has been found out to be an independent risk factor for negative patient consequences following cardiac surgery. It has been associated with consequences such as mortality, morbidity, delirium, falls, hospitalization, prolonged hospitalization, functional decline, increased complications, late recovery of walking ability after surgery, and increase in patient care costs following cardiac surgery.[6,12,13,20-26]

Importance of Determining Frailty in Cardiac Surgery

Cardiac surgery is an area where evaluation of frailty is important. Preoperative determination of frailty is important in terms of guiding both surgical decision-making and patient expectations, as well as optimization of care in the surgical process for frail patients.[3]

Preoperative determination of frailty is an important step in creating realist expectations about postoperative patient outcomes and learning patient preferences.[27] It is crucial to

consider cognitive impairment, disability, and functional status when evaluating patient decisions.[3]

As surgical interventions are stressful per se, it will be possible to reduce the number of adverse events following surgery by identifying patients with frailty before cardiac surgery and taking necessary precautions.[2] Studies have shown that the European Cardiac Operative Risk Assessment System II (EuroSCORE II) and the Society of Thoracic Surgeons (STS) risk scoring systems, which are the most frequently used for cardiac surgery, are deficient in individual risk assessment.[21] Both risk-scoring systems predominantly evaluate the medical diagnoses and comorbidities of patients, but not their frailty.[14]

Although the "poor mobilty" score in the updated EuroSCORE II contributes to accurate risk estimation, this parameter does not directly represent frailty. Adding the frailty status to these scoring systems will increase the accuracy of the assessment.[2] A study has shown that there is no correlation between frailty assessed using walking speed of 5 m and STS score; however, adding frailty to the STS score increased the score performance.[14] Another study evaluating frailty before cardiac surgery has found that a low walking speed of 5 m is associated with a 3-fold rise in morbidity and mortality in the postoperative period.[4] Various studies have found that different frailty scales can predict mortality in the preoperative period.[18,20,28] In addition, the inclusion of frailty measurements in existing risk prediction models might change decisions regarding treatment options.[29] Furthermore, measuring frailty can be crucial in environments with limited resources (such as allocation of transplants or expensive treatments).[3] Further research is required to include frailty as a component in clinical patient and treatment selection in the future.[2,3]

The American Geriatrics Association and the American College of Surgeons have emphasized the importance of evaluating frailty, functional status, cognitive status, and nutrition in the optimal preoperative assessment guideline for the elderly.[30] Frailty and pre-frailty are believed to be closely related to cardiovascular diseases and to be modifiable risk factors for cardiovascular diseases in the elderly. Therefore, it is recommended to screen for frailty in the presence or absence of cardiovascular diseases.[31]

In addition, it is recommended that in the planning of cardiac rehabilitation for the elderly, the frailty status of the patients should be determined when determining the beginning, type, and duration of exercise applications, and a personalized program should be developed based on the functional status of the person.[32]

It is important to use multidisciplinary geriatric teams and approaches in the management of elderly surgical patients with frailty. A systematic review of surgical patients has shown that the use of a comprehensive geriatric assessment to assess functional ability, mental, physical, and cognitive health have a positive effect on postoperative consequences such as complications and length of hospital stay in elderly patients undergoing elective surgery.[33]

In patients with frailty, the incidence of major adverse postoperative cardiac and cerebrovascular events, functional decline, morbidity, and mortality are higher.[24] Monitoring and preventing complications are important as patients with frailty have lower physiological reserves to deal with higher levels of stress.[3] It is reported that postoperative delirium is 2–8 times more common in patients with frailty. Therefore, prevention of postoperative delirium is one of the important goals.[13,23]

Nursing Care for Frail Cardiac Surgery Patients

Frailty syndrome is difficult to manage for multidisciplinary healthcare teams, as it is a multidimensional concept. In health care services, special attention should be paid to elderly patients with frailty who require individually care and treatment. It is thought

that frailty is reversible or preventable with optimal interventions that can support the maintenance or recovery of cognitive functions, nutritional status or physical abilities in frail elderly frail patients. Using their holistic perspective, nurses can performance as case managers for elderly frail patients and work in collaboration with relevant healthcare professionals. It is important to maintain balance in frail individuals due to low physiological reserves and functional loss.[34]

Nurses can cooperate with a multidisciplinary team on targeting issues related to frailty such as increasing physical strength and resistance, weight monitoring, prevention of weight loss, management of nutrition and malnutrition, prevention of falls and pressure injuries, management of polypharmacy and delirium in addition to the surgical care of frail patients.[34] Nursing management of the frail cardiac surgery patient is presented under preoperative, intraoperative, and postoperative care:

Preoperative Care

It is very vital to evaluate elderly surgical patients in the preoperative process and to take their detailed medical history. It is proposed to the nurses who take care of these patients should make a comprehensive geriatric assessment and prepare an individual-specific care plan.[35,36] Preoperative evaluation of the frail patient who will undergo surgery includes topics such as general appearance, frailty, chronic diseases, constantly used drugs, nutritional status, cognitive and psychosocial status, pain status, functional status, risk of falling, laboratory tests, and surgical planning.[37]

It is significant to determine functional status and independence before surgical intervention. Therefore, it is recommended to use multi-parameter frailty scales (Edmonton Frailty Score etc.) to identify areas where preoperative improving is required.[36]

Comorbidities should be questioned while taking the patient's history as it will affect the response to surgery. Also, cardiac risk score should be calculated before cardiac surgery.[36] All medicines used by the patient should be questioned. The drugs used by the patient should be examined and recorded. The patient should be evaluated in terms of polypharmacy.[34,38,39] Inappropriate drug use or side effects related to drugs should be reported to the physician, and the drugs should be regulated.[39]

It is recommended that all patients aged 65 and over should be scanned for malnutrition in the preoperative period.[39] Mini Nutritional Assessment questionnaire, biochemical tests (e.g., serum albumin level), and antrometric measurements can be used to evaluate the nutritional status of frail patients. Also, the patient's involuntary weight loss status without exercise and diet should be evaluated.[35] Nutritional disorders, poor oral hygiene, loss of some or all of the teeth, decreased ability to taste and smell are common problems in the preoperative period in elderly patients. In this case, the patient should be assisted in feeding, the patient with swallowing difficulties should be fed with small and frequent meals, and nutritional support should be provided when necessary.[37] It is important to provide oral nutritional supplements to patients who are malnourished and have a low BMI. It is recommended to drink beverages containing carbohydrates the evening before the operation and 2 hours before the operation. A preoperative drink (least 45 g of carbohydrates) is suggested for patients who undergo major surgery, except for patients with insulin-dependent diabetes. Also, it is important to keep fasting periods short before surgery in elderly patients who will undergo surgical intervention.[35,39]

In addition, the patient's oral hygiene, existing teeth and dental prostheses should also be evaluated. Evaluation of missing teeth and dental prosthesis, in particular, is important for the anesthetist because dental prosthesis may become dislodged, displaced, and obstruct the airway during intubation. Softening creams and pomades should be applied to prevent lip drying and cracking.[37]

Even if there is no history of cognitive impairment, cognitive evaluation of all

patients over the age of 65 should be done within the scope of the comprehensive geriatric evaluation.[35,36] Cognitive status should be evaluated using optimal screening tools (e.g., Mini-Mental State Test).[34-36] The patient should also be evaluated in terms of anxiety. Initiatives to reduce anxiety should be implemented.[35]

To reduce the risk of delirium after cardiac surgery, preoperative delirium risk factors should be identified. Preoperative risk factors leading to the development of delirium after cardiac surgery include the patient's history of stroke, mental status, advanced age, high blood urea nitrogen value, low ejection fraction, presence of hypertension, smoking, high creatinine value, past disease history, presence of pain, comorbidities, presence of diabetes, substance use, visual impairment, physical disability, drug administration, malnutrition, B12 deficiency, dehydration, low education level, atrial fibrillation, pre-dementia, high body mass index, male gender and peripheral vascular disease.[40] Postoperative drugs that cause delirium should be avoided. Patients and patients' relatives should be informed about delirium over the age of 65 and with a high risk of delirium.[39] A standard pain assessment and physical examination should be applied to each elderly patient. Special scales should be used to assess pain in patients with cognitive impairments. Also, if possible, examining for depression using validated scales (the Geriatric Depression Scale etc.) and referral for treatment is recommended.[36]

To evaluate the functional capacity, the daily living activities of the patient, activity/exercise status, walking, and balance, the use of visual, auditory, and movement aids and prostheses should be questioned.[34] In order to plan substitution support measures during the patient evaluation, it is suggested to investigate the presence of family and social support during the preoperative evaluation.[36] In addition, it should be ensured that patients and their relatives are included in all preoperative care.[35-39]

Prehabilitation is recommended for elderly surgical patients to increase organic functional reserve and improve functional status. If a preoperative rehabilitation program is to be implemented, it is important to ensure patient compliance.[39] In addition, a cardiopulmonary exercise test is recommended to patients before major surgeries such as cardiac surgery.[36]

Due to the presence of factors such as sarcopenia and osteopenia associated with frailty, it is necessary to assess the risk of falls in elderly patients before surgery and to take precautions to prevent falls.[34-39] Particularly in elderly patients with postural hypotension, immobility, or at risk of syncope, it is recommended to assess the risk of falling and take preventive precautions. Visual and auditory aids used by the patient should be ready, available and, accessible to the patient at all times.[36]

To reduce respiratory complications, it is recommended that the patient's respiratory risk factors be assessed, and if possible reduced before surgery (e.g., stop smoking). To prevent postoperative respiratory complications, the patient should be taught pre-operative deep breathing exercises, coughing exercises, and use of spirometry.[37,39] In addition, the patient's laboratory findings should be monitored before surgery. Elderly surgical patients should be evaluated for anemia and kidney function.[36,39] Laboratory findings related to frailty such as serum albumin level, vitamin D, vitamin B 12, CRP, leukocyte, neutrophil, TSH, BUN should be monitored.[2,3,17]

In addition, effective communication should be established with the patient in order to obtain an accurate anamnesis and physical evaluation. In order to be able to communicate, the patient's physical disabilities such as hearing and vision should be aware of. The patient with hearing impairment should be spoken slowly, clearly and face-to-face. For the visually impaired elderly patient, the room should be well lit and the patient should not be left alone. In addition, since sensory deficiencies may cause an increase in anxiety in patients,

patients should be evaluated in terms of anxiety.[37]

Intraoperative Care

The intraoperative period is based on maintaining the physiological balance of the patient. The effect of frailty, the presence of chronic diseases and anesthesia complications affect this balance. In order for the elderly frail patient to cope with the surgical experience, a natural environment should be created as much as possible, and communication should be established with the patient so that the patient does not feel isolated and alone. Ensuring the patient's privacy before anesthesia is given to the patient constitutes an important part of nursing care.[37]

When placing an elderly patient on the operating table, it is recommended to position the patient by paying attention to the skin condition (atrophy etc.) and musculoskeletal system (bone deformities etc.) of the patient. To prevent pressure injuries adequate support should be placed thoughtfully on bony spurs.[36] Bony spurs should be evaluated for redness and pallor.[37]

In the intraoperative period, the use of benzodiazepines is not recommended with patients aged 65 and over. The selection of age-appropriate surgical methods and appropriate anesthesia is important, especially with high-risk patients aged 65 years and over.[39] Anesthesia depth should be reduced to prevent postoperative delirium.[3,35,40] Appropriate hemodynamic management should be provided during the intraoperative period.[38]

Postoperative Care

It is important to prevent complications that cause mortality and morbidity in frail elderly patients after surgery. Complications were seen in the early period after open-heart surgery are low cardiac output syndrome, bleeding, myocardial infarction, cardiac tamponade, coronary spasm, arrhythmia, graft occlusion, cardiac arrest, and stroke. Late complications are bleeding in the late period, postpericardiotomy syndrome with pericardial effusion, renal dysfunction, ileus, mesentery ischemia, gastrointestinal bleeding, pneumothorax, respiratory failure, pneumonia, wound infection and wound dehiscence. In order to prevent postoperative complications, nurses should have knowledge about hemodynamic monitoring, respiratory, neurological, digestive, and renal systems, and maintenance methods for providing hemostasis. In addition to these, pain control, wound care, infection control measures, and resting the patient are among the important nursing activities after cardiac surgery.[41]

In terms of respiratory complications, oxygen saturation and respiratory rate should be evaluated periodically in the postoperative period. Arterial blood gas analysis should be done. Patients should be provided with the use of deep breathing exercises and spirometry. Early mobilization is important to prevent respiratory complications in elderly surgical patients.[36,38] Monitoring of cardiovascular measurements (heart rate etc.) is recommended to prevent postoperative cardiac complications. Intermittent pneumatic compression should be ensured when specified.[36]

Elderly patients are at higher risk for hypothermia in the postoperative period compared to adult patients due to inadequacy in heat regulation mechanisms and disorders in metabolic functions. Therefore, the patient's body temperature should be controlled and heating blankets or air heating systems should be used.[37]

Delirium is a common condition in frail elderly patients after cardiac surgery. The prevention, diagnosis, and treatment of delirium is the goal of the multidisciplinary team.[36] It is recommended that patients at risk of postoperative delirium be observed using validated diagnostic tools for 5 days after surgery.[39] In order to prevent delirium, pain control, setting of the physical environment, sleep hygiene, accessibility of vision and hearing aids, removal of catheters as early as possible, and management of drugs that may cause delirium should be provided.[38]

Postoperative pain should be evaluated and treated individually. Failure to prevent pain can lead to delirium. A multimodal approach is recommended for pain management of elderly surgical patients. Non-pharmacological pain prevention interventions should be implemented.[36,38] In pain assessment, verbal pain descriptive scales and McGill Pain Scale can be safely applied in all adults, including the elderly.[37]

It is important to evaluate the risk of falling and to take necessary precautions in the postoperative period. Easy access to vision and hearing aids, prevention and treatment of delirium, early mobilization, and use of assistive walking devices are recommended in the elderly to reduce the risk of falling.[38]

In frail patients at risk of malnutrition after surgery, oral intake should be monitored.[38,39] Evaluation of daily calorie intake and water balance of elderly patients is recommended. In patients with dysphagia or aspiration pneumonia, swallowing and the presence of oral lesions should be evaluated. All elderly patients should be allowed to sit for one hour during and after meals. It is recommended to give nutritional supplements to patients at risk of malnutrition or malnutrition.[36,38] If the patient uses dental prostheses, it should be ensured that they are ready and easily accessible.[36]

Precautions should be taken to prevent postoperative infection. Incision sites, foley catheters, etc. should be monitored for infection. The use of care bundles is recommended to prevent catheter-related infections. Also, attention should be paid to hand hygiene during care.[36,38]

Family participation in care, early mobilization, geriatric consultation if necessary, comprehensive discharge planning, and nutritional support should be provided to frail patients.[38] The preparation of the patient and their relatives before discharge is very important. The discharge plan should include issues such as home care, activities that should not be done, diet to be applied, medications, possible complications, when and how to apply to the clinic for post-operative control.[37]

Frail elderly patients are at risk for pressure injuries, so monitoring and prevention of pressure injuries are important. It is recommended to reduce friction, moisture, and shear force to prevent pressure injuries. In addition, adequate and balanced nutrition is important in terms of preventing pressure injuries.[36,38]

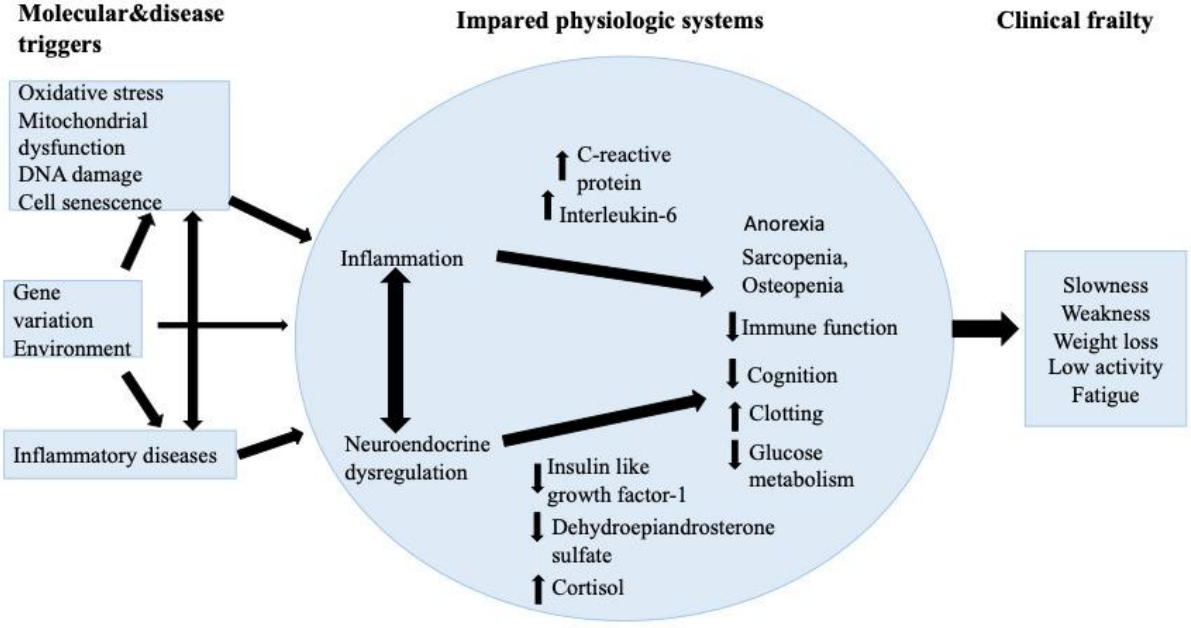

Figure 1. Hypothesized Model of Frailty and Adverse Health Outcomes[7]

CONCLUSION AND RECOMMENDATIONS

Frailty has become a significant issue in cardiac surgery in recent years. It is important to identify frail cardiac surgery candidates and provide appropriate medical and nursing management for them, as the prevalence of frailty is higher in cardiac surgery candidates compared to other patient groups and is a risk factor for adverse patient outcomes after cardiac surgery. Identifying frail patients and providing appropriate interventions are crucial with regard to increasing the quality of life of the patient and the additional burden it will bring to the health system. Therefore, it is necessary to treat patients in a holistic manner and ensure appropriate follow-up and treatment planning by providing a multidisciplinary team approach (including physicians, relevant specialists, nurses, and other healthcare professionals).

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