The Management of Patients with Kidney Failure in Virginia Henderson’s Nursing Conceptual Framework to Prevent Venous Thrombosis

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Abstract

Introduction and Objectives. The application of nursing theories into clinical practice varies from case to case and Virginia Henderson’s approach highlighting the assessment of patient needs is essential in providing quality medical services and holistic care. Venous thromboembolic disease in its clinical spectrum includes both deep venous thrombosis and pulmonary embolism and they are frequently found as associated pathologies in patients with kidney failure. In addition, kidney failure is a risk factor for the development and progression of cardiovascular diseases and has an increased risk of cardiovascular morbidity and mortality. Because of the large number of pathophysiological mechanisms involved, these patients have an increased risk of thromboembolic events. The purpose of this paper is to apply the holistic approach to the clinical process, in order to establish a nursing process that reflects diagnosing and determining the best therapeutic option for the prevention of venous thrombosis.

Materials and method. We are going to introduce the case of a 70-year old patient hospitalized in the Emergency Hospital. The patient was diagnosed with a stage 4 chronic kidney disease aggravated over 3 years, mixed vascular and diabetic nephropathy, secondary anemia, hypertension, type II DM evolving for about 21 years, treated with insulin, complicated by ischemic heart disease, with permanent atrial fibrillation with an average AV nodal rate, diabetic retinopathy, lower limb peripheral arterial disease and amputation of right big toe, with suspected deep vein thrombosis. The patient is a peaceful, communicative person, with an emotive behavior, anxious about his state of health. He manifests anxiety and fear of getting into a hemodialysis program. The patient moves with difficulty, because of the pain that prevents him from having proper personal hygiene and a restful sleep. The patient was evaluated in terms of the 14 basic needs, according to the conceptual model of Virginia Henderson, in order to develop and apply the individualized care process. The nursing assessment was made, the results were analyzed and interpreted, the following dependency needs: the need to eliminate waste, the need to breathe and have a good circulation, the need to eat and stay hydrated, the need to avoid hazards, the need to move and have a good posture, the need to sleep and rest, the need to be clean, tidy and protect the skin. It is determined that the patient is independent in meeting the...
Introduction

The nursing process is dynamic, adaptable to individual needs and society requirements and maintains an unaltered main objective, i.e. achieving a better state of health for the individual, family and community. The care is patient-centered, but the patients are no longer perceived only as individuals suffering from a disease. They are holistically assessed as people with physical, emotional, psychological, intellectual, social and spiritual needs. These needs interrelate, are interdependent, of equal importance and represent the foundation of nursing interventions.

The nursing process aims at applying the following steps:
1. Appraisal (the stage of data collection with the purpose of identifying current or potential health problems);
2. Establishing the nursing diagnosis (identifying dependency problems and saying the diagnosis clearly and precisely);
3. Planning (setting objectives and preparing a care plan for solving the nursing diagnostic problem);
4. Implementation (applying the established care plan and updating it constantly, depending on the interventions);
5. Assessment (determining the patient response to the care interventions and setting the goals that have been achieved);

The risk of arterial and venous thromboembolism in hospitalized patients has led to awareness raising and a careful application of preventive measures for thrombosis. Early recognition of the symptoms of thromboembolism has led to regular administration of platelets and anticoagulants. Patients with chronic kidney disease represent a special risk group for thrombosis, both within the cardiovascular area and in the venous circulation [1]. Significant comorbidity, including cardiovascular disease in patients with renal failure, requires anticoagulation, but the coagulation disorders either with episodes of severe bleeding or thrombosis represent an important cause of morbidity and mortality for these patients [2]. To prevent thrombosis, anticoagulants are administered, but the bleeding risk still coexists and there is also the risk that the drugs com-
monly used to inhibit clotting are eliminated by the kidneys, raising additional problems [1]. The patients with kidney failure are critically ill patients with an increased risk of venous thromboembolism (VTE), because of their exposure to the general factors of VTE and to those specific to patients hospitalized in ICU, such as restraint, sedation, mechanical ventilation, vasopressors, invasive methods, central venous catheter. At the same time, thromboembolic events are difficult to diagnose because they can mimic other diseases. From this perspective, diagnostic and preventive strategies are applied to patients [3]. The use of pharmacological as well as non-pharmacological prophylactic measures could reduce the incidence of VTE. The use of such prophylactic measures, therefore, viewed as an indicator of quality, is particularly relevant for the care of critically ill patients. Most patients with kidney disease have other diseases that cause kidney disease or contribute to the risk of cardiovascular events or even death. Diabetes mellitus, hypertension, cardiovascular disease and anemia are more common in patients with chronic kidney disease (CKD) than in people who do not have CKD, and the prevalence of major comorbidities such as CKD is progressing. Most patients with advanced CKD have at least one comorbidity. The primary care providers and the specialists have an important role in the diagnosis and management of comorbidities in patients with CKD. The critically ill patients who are hospitalized in ICU with kidney failure or have developed it along the way, have a four-time higher risk of developing venous thrombosis than patients who do not have kidney failure [4]. The clinically symptomatic and asymptomatic episodes of VTE are both common in patients with renal failure and are associated with high mortality. By the mid-90s, most studies have focused on surgical patients, given their high incidence of VTE. More recently, randomized controlled trials have shown that the risk of VTE in patients with medical conditions is similar to that of surgical patients. [5,6]. The patients who are hospitalized in the ICU and have received the standard prophylaxis have high incidence of VTE [7]. Besides the vein thrombosis prophylaxis protocol, it is necessary to explore other prophylaxis regimens and also to introduce some educational programs for clinicians in the ICU, which could alter the incidence of VTE in these departments [7,8]. Therefore, understanding the antithrombotic management strategies in patients with renal failure is of major importance.

**Materials and methods**

We are going to present the case of a 70-year old patient hospitalized in the Emergency Hospital. The patient has been diagnosed with an aggravated stage 4 chronic kidney disease for about 3 years, mixed vascular and diabetic nephropathy, secondary anemia, hypertension, type II DM evolving for about 21 years treated with insulin, complicated by ischemic heart disease, with permanent atrial fibrillation with an average AV nodal rate, diabetic retinopathy, lower limb peripheral arterial disease and amputation of right big toe, with suspected deep vein thrombosis.

**Patient profile**

The patient M.N., aged 70, is hospitalized in the intensive care unit. From the data collection done in order to determine the care plan, it was found that the patient had at admission, as dependency manifestations, a worsened health condition, physical asthenia, no fever, mild dyspnea, pale skin and mucous membranes, oliguria, massive lower limb edema, pain in the right leg, presenting on the posterior chest and on the forearm multiple round formations with their bottom covered by yellowish detritus, pruritic, painful, surrounded by an erythematous halo, with a progressive disease evolution of 3 weeks, and also the right big toe amputation.

**The clinical and paraclinical examination reveals**

vesicular murmur bilaterally present decreased to the basal right side, without stasis rales, B.P. = 140/80 mmHg, grade II / IV systolic murmur in the mitral focus, muffled heart sounds, slim flexible abdomen without signs of peritoneal irritation, impalpable kidneys, minimal presence of diuresis. ECG reveals atrial fibrillation with AV = 64 / min, with flat T waves. The cardiac ultrasound shows pericarditis with fluid in moderation, moderate mitral regurgitation and moderate systolic dysfunction. The Doppler ultrasound highlights the atheroma of carotid and vertebral systems in an advanced form, chronic arterial disease and renal artery stenosis. The dermatologic examination shows pyoderma gangrenosum on the forearms and on the left brachio-cervical region. Biological nitrogen retention syndrome, metabolic acidosis and normochromic anemia were present.

From the data collection it was found that our patient is a peaceful person with an emotive behavior, who is anxious about his health. The patient says he lives in good living conditions in a salubrious home, with his family. He is a communicative person, answers the questions, asks additional questions, which hides a
Clinical studies

marked anxiety and fear of not getting into a hemodialysis program. The patient moves with difficulty due to the pain that prevents him from having proper hygiene and a restful sleep.

Results

Based on the analysis of the data from the medical history, clinical examination, laboratory tests and the nursing assessment, we estimated that our patient patient had the following nursing diagnoses and problems with dependency manifestations in the following affected fundamental needs, for which he must be cared for, supported both physically and mentally:

1. The need to eliminate waste
   - Inadequate quantity and quality of elimination related to the nitrogen retention syndrome, characterized by edema and oliguria.
   - Fluid excess and electrolyte imbalance linked to decreased diuresis and diet restrictions, manifested by metabolic acidosis.
   - Self-esteem disturbance related to the severity of renal suffering and loss of independence, manifested by marked anxiety and fear of not getting into a hemodialysis program.

2. The need to breathe and have a good circulation
   - Shortness of breath determined by cardiovascular processes manifested through the acceleration of the breathing rhythm.
   - Circulation disorders caused by changes in the kidney functions of filtration, reabsorption and elimination, characterized by edema.
   - Altered peripheral perfusion secondary to the venous stasis.

3. The need to eat and stay hydrated
   - Inadequate nutrition due to nutrient deficiency caused by fluid and electrolyte imbalance, manifested through anorexia.
   - Inadequate nutrition due to nutrient deficiency caused by lack of appetite and anxiety, manifested by reduced consumption of fluids and food.

4. The need to avoid hazards
   - Pain in the lower limb caused by the right big toe amputation, manifested by difficulty of movement and risk of infection.
   - Decrease in exercise tolerance linked to kidney and circulatory dysfunction.

5. The need to move and have a good posture
   - Immobility caused by pain, manifested by muscle weakness, difficulty of movement and pain in the right leg.
   - Lack of knowledge on preventive measures and treatment of venous thrombosis.

6. The need to sleep and rest
   - Difficulty in sleeping caused by pain and anxiety, manifested by frequent awakenings and disturbed sleep.
   - Difficulty at rest caused by discomfort and fear of procedures, manifested by fatigue, irritability, sadness.

7. The need to be clean, tidy and protect the skin
   - Difficulty in taking care of himself caused by immobility, fatigue and pain, manifested by deficient hygiene.
   - Dysfunction of the capacity for self-care linked to decreased exercise tolerance, secondary to inefficient ventilation and oxygenation disorders.
   - Damage to skin integrity due to immobility, manifested by the presence of multiple round formations on the posterior chest and on the forearm, with their bottom covered by yellowish detritus, pruritic, painful, surrounded by an erythematous halo, with a progressive disease evolution of 3 weeks.
   - Altered skin integrity caused by electrolyte imbalance and immobility, characterized by edema and trophic injuries.

After establishing the dependency problems, it is estimated that the patient is independent in meeting the following needs:

1. The need to get dressed and undressed
   - The patient wears clean and tidy clothing, suitable for the climate and the season.

2. The need to maintain a normal body temperature
   - Body temperature within normal limits.

3. The need to communicate
   - The patient shows a normal verbal flow, normal functioning of the sense organs, good relationships with family, friends, colleagues.

4. The need to practise religion
   - Within limits, he can attend religious services.

5. The need for achievement
   - The patient shows ambition to achieve the specific activities of his age.

6. The need to relax
   - The decrease in the state of mental strain, optimal psychological and emotional development.
   - The patient occupies a part of his time with various activities, which help him detach from his health concerns.
7. The need to learn how to preserve his health

➢ He manifests desire and interest in learning, in knowledge acquisition.

The knowledge and assimilation of the nursing process’ stages allow the nurse to plan, organize and streamline its business, with the main objective of increasing the quality of care, with a direct impact on patient outcomes. From this perspective the particularities of the nursing process are presented.

1. The need to eliminate waste

The Nursing Diagnosis

➢ Inadequate quantity and quality of elimination related to the nitrogen retention syndrome, characterized by edema and oliguria.

➢ Fluid excess and electrolyte imbalance linked to decreased diuresis and diet restrictions, manifested by metabolic acidosis.

➢ Self-esteem disturbance related to the severity of renal suffering and loss of independence, manifested by marked anxiety and fear of not getting into a hemodialysis program.

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<tr>
<td>- Maintaining the electrolyte balance</td>
<td>- Assessment of the electrolyte status: serum level of electrolytes, daily changes in body weight, indication of fluid intake and loss, identification of persistent skin fold or edema.</td>
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<td>- Improving the feeling of self-esteem</td>
<td>- Assessment of the patient nutritional status (weight, height, laboratory data), assessment of the patient nutritional profile (history, preferences, restrictions), identifying the factors that contribute to the alteration of nutritional intake, assessment of the patient and family response to the renal suffering and proposed therapeutic methods, assessment of the relationship between the patient and his family members, assessment of the patient and his family’s adaptability.</td>
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<td>- The patient and his family members will be encouraged to understand and accept the change in lifestyle, diet, occupation, social role, degree of independence</td>
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2. The need to breathe and have a good circulation

The Nursing Diagnosis

➢ Shortness of breath (dyspnea) caused by cardiovascular processes manifested through the acceleration of the breathing rhythm.

➢ Circulation disorders caused by changes in the kidney functions of filtration, reabsorption and elimination, characterized by edema.

➢ Altered peripheral perfusion secondary to the venous stasis.

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<td>Improving the exchange of respiratory gases</td>
<td>- nurses make sure the patient has a position favoring breathing and pulmonary expansion; the ward ventilation is ensured the patient is given the prescribed medical treatment and oxygen therapy permeabilising the airways in order to reduce clinical manifestations of hypoxia.</td>
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<td>Improving the venous circulation and tissue perfusion. Decreasing edema.</td>
<td>- the vital functions are monitored - chest percussion to mobilize tracheobronchial secretions; measures to reduce pain: administration of pain relievers taking into consideration the depressant respiratory effect they could have - the patient is taught how to use relaxation techniques: to inspire slowly and deeply through his nose, letting the abdomen to advance as much as possible; to expire with pursed lips and by contracting the abdominal muscles; the risk factors prior to admission are evaluated and also the ones acquired during hospitalization; the selection of venous thrombosis prophylaxis methods will be done through repeated assessment of VTE risk and the risk of bleeding every day.</td>
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<td>- the patient is taught how to use relaxation techniques: to inspire slowly and deeply through his nose, letting the abdomen to advance as much as possible; to expire with pursed lips and by contracting the abdominal muscles; the risk factors prior to admission are evaluated and also the ones acquired during hospitalization; the selection of venous thrombosis prophylaxis methods will be done through repeated assessment of VTE risk and the risk of bleeding every day.</td>
<td>- therapeutic management: taking steps to reduce the risk of VTE.</td>
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<td>- monitoring anticoagulant therapy; monitoring INR and PT during initial subcutaneous treatment and then orally.</td>
<td>- proper use of TVE prophylaxis (anti-embolism stockings, foot impulse devices or intermittent pneumatic compression devices).</td>
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<td>- proper use of TVE prophylaxis (anti-embolism stockings, foot impulse devices or intermittent pneumatic compression devices).</td>
<td>- daily moderate and mobilizing physical exercise</td>
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<td>- assessment of changes in the overall condition of the patient.</td>
<td>- assessment of changes in the overall condition of the patient.</td>
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3. The need to eat and stay hydrated
   The Nursing Diagnosis
   ➢ Inadequate nutrition due to nutrient deficiency caused by fluid and electrolyte imbalance, manifested through anorexia.
   ➢ Inadequate nutrition due to nutrient deficiency caused by lack of appetite and anxiety, manifested by reduced consumption of fluids and food.

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<td>Improving the nutritional status of the patient</td>
<td>- the balance ingestion-disposal is achieved to evaluate and determine the fluid intake; - the patient’s preferences on allowed and forbidden food are further explored; - a dietitian is consulted to establish a diet according to the associated conditions. - the patient is taught the food categories from the food guide and quantitative and qualitative equivalents of foods for the replacement of a food with another; - the patient is counseled about the importance of diet in the evolution of his illness; - adequate hydration is ensured to restore the acid-base balance.</td>
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4. The need to avoid hazzards
   The Nursing Diagnosis
   ➢ Pain in the lower limb caused by the right big toe amputation, manifested by difficulty of movement and risk of infection.
   ➢ Decrease in exercise tolerance, and related to the renal and circulatory dysfunction.

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<td>- The patient will benefit from a safe environment without injuries and infections during hospitalization; - the patient will have a good physical and mental condition during hospitalization; - the pain intensity will be reduced in the shortest time possible.</td>
<td>- the patient is encouraged to rest as much as possible; - the patient is helped to achieve a comfortable position and to change position when desired. - the extent and causes of anxiety are evaluated; - the patient is encouraged to express his own opinions and feelings, is listened carefully and is supported with a calm presence; - the patient is provided with education for accident prevention; - the compliance with all hygiene norms is constantly verified; - optimal microclimate conditions are ensured in the ward. - the patient is provided with the medications prescribed by the doctor</td>
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5. The need to move and have a good posture
   The Nursing Diagnosis
   ➢ Immobilization related to pain, manifested by muscular weakness, difficulty in movement and pain in the right leg.
   ➢ Lack of knowledge on preventive measures and the treatment of venous thrombosis.

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<td>Patient education on the prevention and therapeutic protocol of venous thrombosis</td>
<td>- assessing the patient’s knowledge and his desire to learn; - providing the necessary information about the therapy, - the evolution and prognosis of the disease, by carefully using the terms adapted to the understanding of the patient and choosing attentively the appropriate moment for discussion - a passive physical exercise program is determined together with the patient and after that, active exercises for mobilization, to help him regain independence; - the aspect of edema in the lower limbs is constantly monitored and the patient is mobilized to change position every 2 hours; - the patient is taught to perform active muscle exercises; - the skin is protected from lesions and the extremities are gently massaged, as well as the areas prone to pressure sores, to prevent venous stasis or thrombotic complications;</td>
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<td>Reducing anxiety</td>
<td>- the patient is encouraged to express his concern or fear and to ask questions whenever he has doubts - the patient is told about the reasons for the compliance with the therapeutic plan with all its therapeutic aspects: pharmaceutical, dietary, lifestyle - the patient is helped to identify stressful situations and is told about the need to overcome them. - a safety environment and a protective sensation is created through discussions; - proper environmental conditions are ensured and the patient is taught to practise relaxation techniques and breathing exercises 15 min before sleep - the nurses observe if the periods of rest match the body needs; - the patient’s confidence in his carers and his self-confidence are stimulated, so that the patient could maintain social contacts that keep him awake during the day and stimulate his attention;</td>
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6. The need to sleep and rest
   The Nursing Diagnosis
   ➢ Difficulty in sleeping caused by pain and anxiety, manifested by frequent awakenings and disturbed sleep.
   ➢ Difficulty at rest caused by discomfort and fear of procedures, manifested by fatigue, irritability, sadness.
7. The need to be clean, tidy and protect the skin

The Nursing Diagnosis

- Difficulty in providing self-care, caused by immobility, fatigue and pain, manifested by deficient hygiene.
- Dysfunction of the capacity for self-care linked to decreased exercise tolerance, secondary to inefficient ventilation and oxygenation disorders.
- Damage to skin integrity due to immobility, manifested by the presence of multiple round formations on the posterior chest and on the forearm, with their bottom covered by yellowish detritus, pruritic, painful, surrounded by an erythematous halo, with a progressive disease evolution of 3 weeks.
- Alteration of skin integrity caused by electrolyte imbalance and immobility, characterized by edema and trophic injuries.

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<td>Increasing independence in performing self-care activities.</td>
<td>- encouraging the patient to progressively try to conduct certain activities by himself: to dress, to walk, etc</td>
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<td>Increasing the muscle tone and the patient ability to carry out certain tasks.</td>
<td>- establishing a program of physical activities whose intensity and duration will be increased progressively (approximately 5 minutes from one stage to another, depending on the individual tolerance)</td>
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<td>Maintaining and improving skin integrity and the protection of edematous and altered tissue.</td>
<td>- the patient is encouraged and supported during the performance of physical activities whose intensity will be increased progressively</td>
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<td>- careful monitoring of the skin integrity</td>
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<td>- frequent change of the patient’s position in bed</td>
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<td>- daily weighing of the patient and achieving an input / output water balance</td>
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<td>- raising the edematous extremities</td>
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<td>- preventing bedsores</td>
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<td>- ensuring skin protection by complying with the hygiene rules the patient’s physical and mental preparation for skin examination</td>
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<td>- cutaneous manifestations are subject to local and systemic anti-infective therapy</td>
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<td>- the sampling of purulent discharge from the skin lesion in order to conduct the bacteriological examination</td>
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<td>- patient awareness about the importance of maintaining a hygienic condition;</td>
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<td>- health education for the patient to help him maintain the skin clean;</td>
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<td>- ensuring optimal conditions in the patient’s room: proper ventilation, constant temperature.</td>
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The therapeutic attitude consisted in assessing and treating the patient from the perspectives of cardiology, nephrology, dermatology, diabetology and plastic surgery. The patient was assessed through a precise interrogation and examination process, according to the medical prescriptions, in conformity with the 14 basic needs and his state of health was estimated as accurate as possible, in order to identify current or potential problems and for the application of holistic care.

The patient was assessed at admission and he is considered to be one of those patients who have experienced or are expected to show a significant decrease in mobility over three or more days, or one of those patients manifesting a relative reduction of mobility in relation to the normal state and have one or more of the risk factors of VTE. The general medical profile of the patient is with a high risk for VTE and the risk reduction has entailed the need to encourage the patient to mobilize himself as soon as possible and also to perform the pharmacologic prophylaxis for VTE.

The treatment is continued until the patient no longer has an increased risk of venous thromboembolism. The determination of nursing diagnoses contributed to identifying the patient’s problems and to the further development of the nurses’ interventions, maintaining the autonomy of the nurses. During hospitalization our patient received electrolyte and acid-base rebalancing treatment, diuretics, sodium bicarbonate, antiplatelet, beta blocker, low molecular weight heparin (LMWH), oral anticoagulants, broad spectrum antibiotics.

Thromboprophylaxis was made by assessing the risk for bleeding and for VTE. As for metabolic, the glucose values were controlled with insulin.

In our case, the application of the nursing process according to Virginia Henderson’s conceptual model and the provision of individualized care for a patient with kidney failure, according to medical prescriptions, to prevent venous thrombosis, has significantly reduced the occurrence of complications and decreased the hospitalization period. The patient evolution was favorable, with the improvement of his general state of health and heart failure incidence, progressive weight loss, remitted lower limb edema, the decrease of the amount of pericardial fluid and diuresis reaching 1500 ml. The evolution of cutaneous lesions was also favorable in systemic and local antibiotherapy. The patient is currently discharged in a stabilized cardiopulmonary and hemodynamic condition.

At discharge, the patient’s quality of life shows a notable increase, the social and emotional status of the patient has visibly improved and he presents a good physical and mental development, as well as improved self-esteem. In addition, the hospitalization and medical care expenses were also considerably reduced.
Discussions

Nursing is a very young scientific discipline in the constellation of social and human sciences. The nursing process was commonly accepted by experts as a scientific method for providing high quality nursing care. The purpose of this science is the individualization and humanization of the nursing care provided for healthy or diseased individuals. In the development of the scientific activity of the nursing professionals, the emergence of concepts such as nursing process, nursing diagnosis, nursing care plan, was a moment of special importance, placing their work alongside the work of the other professionals from the patient care team. According to the standards of care, the professional nurse requires the use of the nursing process and this involves the participation of nurses in training activities which lead to increased knowledge about the nursing process and is also a recommended activity. In most cases, the nursing process is not systematically performed, most often being replaced with routine care. The nursing process involves assessing the patient based on affected basic needs, identifying the care priorities, establishing clear objectives in the short, medium and long term and making specific nursing interventions, personal and delegated, according to the plan, in order to resume the independence of the affected emotional needs and maintain the independence of the autonomous needs.

The determination of patient response to care interventions requires an assessment and for this reason there will be identified the changes to be made, in order to update the nursing process, the established objectives, the planned nursing interventions and the expected results. The number of nurses, the number of patients and the nurses’ knowledge about the nursing process are important factors which affect the application of the nursing process.

Most often, the nurses easily apply the individualized nursing process but with the growing number of patients this can no longer be applied. A lack of knowledge about the nursing process plays a key role regarding the proper application of the nursing process. One of the main challenges is the level of knowledge about the nursing process and the results of some studies show that after the training on the nursing process implementation, the capacity of the nurses for the utilization and recognition of the nursing diagnoses has increased [9,10].

Conclusions

Besides the medical treatment, nursing plays an important role in the proper care and the favorable evolution of the patient. The application of the nursing process and of the holistic concept in the clinical context enables improvement of the standards of care by assessing the patient’s needs and developing a pragmatic care plan. The identification of nursing diagnoses contributes to identifying the patient’s problems and further developing the nursing interventions while maintaining the autonomy of the nurses.

Safety antithrombotic therapy is a major concern, especially in patients with renal failure, because of the potential of increased risk for bleeding incidents.

Therefore, understanding and applying medical management strategies and thrombotic nursing care for patients with renal failure is a challenge of major importance.

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References