Chapter 3

Care of a patient with coronary artery disease: a case report

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DOI: 10.48269/978-83-67491-19-8-03

Abstract
Ischemic heart disease is a condition of ischemia in the coronary arteries of the heart, the most common cause of which (98% of cases) is atherosclerotic lesions. Although a great deal is known about ischemic heart disease, there is a constant need to update knowledge regarding treatment, prevention and the behaviour of nursing staff towards patients. This is because coronary heart disease, despite the fact that a lot is known about its pathomechanism and risk factors, still has high mortality rates.
Key words: ischemic heart disease, nursing care, nursing diagnosis

Introduction

The subject of this paper is the study of ischemic heart disease, using observation and care of an individual as an example. The disease can be defined as ischemic conditions in the coronary arteries, the most common cause (98% of cases) of which is atherosclerotic lesions. A consequence is myocardial hypoxia [1,2]. Atherosclerotic lesions are caused by a long-lasting inflammatory-immunological process that causes endothelial cell damage [3].

Coronary artery disease is responsible for 610,000 deaths per year, which means that one out of every four deaths is due to sequelae of the disease. It is the third most common cause of mortality worldwide, reaching 17.8 million deaths per year [4]. The course of coronary artery disease is gradual, the first symptoms may occur at age 40, while those aged 65 and older account for up to 85% of all deaths. There are about 550 million people worldwide living with cardiovascular disease, and this number continues to rise. The main factors for the increase are abnormal lifestyles, an aging population and improving survival rates after heart attacks and strokes. In terms of gender, there is a higher proportion of women (290 million [53%]) than men (260 million) [5].

The rationale for choosing the topic is insufficient knowledge of the role of the nurse in caring for coronary artery disease patients. It is also important to show the impact of holistic care on the patient's quality of life. Coronary artery disease, despite thorough understanding of its pathomechanism and risk factors, still achieves high statistics related to mortality. The main reason may be the lack of modifications during the patient's life and the low level of education regarding the disease itself. The role of the nurse in the care of a patient with coronary artery disease is crucial. The nurse, through her actions, should enable the patient to live with optimal quality. In addition, during the illness the nurse is an important person who can support the patient in three spheres, namely physical, mental and social.

Purpose of the study and research problems

The main objective of this study is to describe the care of a patient with ischemic heart disease. The research problems that emerge when caring for a patient with ischemic heart disease are:

1. What health problems occur in a patient with coronary heart disease?
2. What are the specifics of caring for a patient with coronary heart disease?
3. What is the role of the nurse in caring for a patient with coronary artery disease?
4. How does coronary artery disease affect the patient's psycho-social state?

The subject of the study of this paper is the diagnostic, therapeutic and nursing process of a patient with ischemic heart disease. The nursing model chosen and used in the study was Orem's model. The quintessence of this model is its focus on three key theories: self-care, its limitation and the nursing system itself. In her model, Orem propounded the theory that every person has an intrinsic need for self-care and a desire to maintain health from birth, and is self-aware of this. The nurse should first of all be able to notice the deficit and the resulting health problems of the patient. This will enable to fully provide proper care and also apply the optimal nursing system. Orem included three nursing systems in her model: fully compensatory, partially compensatory and supportive and educational. The case of caring and nursing a patient with coronary artery disease is a combination of the last two types. The argument behind the choice of the partially compensatory type is that the patient is clearly weakened, which translates into limited ability to perform certain activities as well as reduced motivation. The nurse's task is not to bail the patient out but to help the patient perform activities, as much as the patient's condition allows; their active participation in treatment procedures is important. The second system of nursing, on the other hand, aims to show support, to minimise the deficit in self-care [6]. As a result, the patient consciously performs activities that improve their

well-being. When the patient does not accept their illness, their system, is a key therapeutic factor. Through its use, the patient receives the support they need, showing patience, understanding consequently they feel comfortable and their willingness to mobilise increases.

Research methods, techniques and tools

The method used was the individual case method using the nursing process. The data collected, as well as information related to the patient's health condition, was obtained through the use of individual research techniques and tools. The key source of information was an interview with the patient. Observation was also used and a physical examination was conducted. The patient's medical history was also studied, highlighting laboratory and imaging results.

Research tools used:

- The numerical Scale (Visual Analog Scale, VAS) – used to assess pain intensity, zero means no pain and ten is unbearable pain.
- The Acceptance of Illness Scale (AIS) – used to assess the patient's acceptance of the disease. The scale contains eight statements whose answers are scored from one to five points. The maximum number of points is forty points. The higher the score obtained, the greater the patient's acceptance towards the disease and mental adaptation to the associated limitations [7].
- The Beck Depression Inventory – a scale for assessing the level of depression, contains twenty-one statements. The range of scores obtained is from zero to sixty-three points. The score obtained is not a diagnosis of depressive syndrome, but only a useful guideline when planning patient care [8].
- The Barthel Index is used to determine functional fitness, the ability to perform eleven activities of daily living. It takes into account the degree of independence of the patient. Group I is the range of points obtained from eighty-five to hundred and is an independent patient. Group II, on the other hand, refers to patients with a moderate range of lack of independence, twenty-one to eighty-four points. On the

other hand, if a patient scores zero to twenty points, he or she belongs to the group of patients with a high range of dependence [9].
- The Satisfaction with Life Scale (SWLS) is used to determine individual satisfaction with life, and consists of five statements that are rated on a seven-point scale. The score indicates the degree of satisfaction with one's life. The range of possible scores is from five to thirty-five points [10].
- The SCORE2 Scale determines the probability of death within ten years from cardiovascular causes [11].

A case report

A 81-year-old man was diagnosed with coronary artery disease in the Cardiology Department. The patient's condition was moderately severe, blood pressure 93/51, pulse 109/min, heart rate steady. The severity of pain on the VAS scale was 6, which means moderate pain. The patient exhibited effort tolerance with dyspnoea NYHA II. Blood samples were taken for laboratory tests. The laboratory tests showed individual abnormalities: CRP – 56.8 mg/l (normal <6.00), red blood cells – 4.18 T/l (4.50–6.50), haematocrit – 36.6% (40.00–54.00), troponin T – 20.10 pg/ml (<13.00). Electrocardiography was performed with twelve or more leads: intermediate axis, sinus rhythm regular 60/min, recording within normal limits. Coronary angiography revealed the presence of wall lesions in the LM, LAD, D1, Cx and OM, and the RCA was unobstructed and there was no restenosis in the sphere of implanted stents. The patient did not require revascularisation surgery. The treatment used was Effox long 50 mg, Prestarium 5 mg, Augmentin 1 g and Lacidofil. The patient was advised to remain under constant cardiological control. He also needed to have periodic follow-ups at the PCP with lab tests including CBC, creatinine, ionogram, lipid profile.

The patient currently complains that he is experiencing coronary pain and respiratory distress during exercise. This impedes his daily functioning. The patient is not a physically active person; he used to ride a bicycle before his diagnosis. The patient experiences fatigue due to sleep

problems, which results in lack of strength to undertake physical exertion. In his history, the patient admits to falls associated with the occurrence of dizziness and fainting. Because of this, the patient experiences anxiety. The patient describes his self-esteem as reduced, caused by limited independence, a sense of being a burden on his family. Low blood pressure values have been present for several months, resulting in headaches. The patient's family has reported that the patient is experiencing increasing cognitive impairment, which translates into worsening self-care. The patient's weight is 90 kg, height 171 cm. His BMI is 30.78, which indicates that he is overweight. The patient regularly passes stool and there is uncontrolled urination. The skin is grey, moist and cold. There are surgical wounds and the risk of bedsores is increased.

The patient also suffers from unstable angina, dyslipidaemia, gastric ulcer disease, prostatic proliferation, and was found to have bilateral hearing loss. A coronary angiography, PCI RCA with the placement of two DES stents was performed at the Cardiology Department.

Questionnaire results

- The VAS scale. The patient scored six points out of ten (range zero to ten), indicating a significant presence of pain. Discomfort is due to the presence of coronary pain.
- The AIS scale. The scale consists of eight statements regarding the patient's attitude toward the disease. The score obtained by the patient is twelve points out of forty points, which equates to non-acceptance of the disease. The patient was an active person before the exacerbation of the disease, although now he cannot perform activities involving increased physical exertion. He feels unnecessary and a burden to his family. The patient does not accept his illness to a high degree, and would like to return to his pre-disease state of health. He finds that the disease is impairing his quality of life.
- Beck Depression Inventory. The patient answered twenty-one questions whose individual answers are scored from zero to three points. He scored twenty-one points out of sixty-three, indicating the

possibility of moderate depression. The patient's history shows that he is experiencing a significant decrease in mood, prolonged fatigue and fear for his life.

– The Barthel Index is used to determine functional fitness, the ability to perform eleven activities of daily living. It takes into account the degree of independence of the patient. A group I patient scores between eighty-five and hundred points and such a patient is considered independent. Group II, on the other hand, refers to patients with a moderate range of lack of independence; these patients score between twenty-one and eighty-four points. Finally, if a patient scores zero to twenty points, he or she belongs to the group of patients with a high level of dependence [9].

Nursing diagnosis

Nursing diagnosis 1:
coronary pain due to inadequate oxygen supply to the myocardium manifested by burning pain behind the sternum [12]
Purpose of care:
to reduce the sensation of pain [12].
Nursing intervention plan [12]:

– assessment of pain with particular attention to pain characteristics, e.g., presence of throbbing, burning or pressure pain;
– determination of the intensity of pain experienced by the patient using the VAS analogue scale;
– checking laboratory results that have a significant impact on the patient's deterioration. Performing ECG, ST-T-segment evaluation to distinguish coronary artery disease from myocardial infarction, and other diagnostic tests ordered by the doctor, such as troponin determination;
– psychological and emotional support of the patient;
– administering nitro-glycerine for pain relief, be sure to take the drug at all times and follow the standards for storing the drug and the open package;

– monitoring the patient's basic vital signs during pain and after nitrate administration.

Justification for implementing nursing interventions:
the increase in blood pressure and heart rate due to stimulation of the sympathetic nervous system in pain, the use of nitrates can lead to hypotension. Nitro-glycerine tablets should be stored in a place protected from light, dryness and high temperatures, as the compound will be inactivated when exposed to light, moisture and heat. Shelf life should not exceed four months, as nitro-glycerine loses its therapeutic properties. The retentive tablet causes a slight tingling sensation when placed in the mouth. Nitro-glycerine causes vasodilation of blood vessels, which lead to a drop in blood pressure and which explains the appearance of dizziness, headaches or syncope [12].
Evaluation of care outcomes and nursing interventions undertaken:
the patient's pain improved slightly. The problem requires further observation.

Nursing diagnosis 2:
risk of myocardial infarction due to the presence of risk factors [12]
Purpose of care:
prepare the patient and family to modify risk factors [12].
Nursing intervention plan [12]: to schedule educational sessions regarding:

– blood pressure control – through weight loss, reducing salt intake, increasing physical activity through an exercise programme, use of prescription medications;
– hyperlipidaemia – reducing portion sizes of foods rich in saturated fatty acids and cholesterol, dietitian care and family involvement is recommended;
– risk of diabetes – the patient should control blood glucose levels and follow dietary and pharmacological recommendations;
– smoking – if the patient is unable to stop smoking on his/her own, s/he should consult a specialist.

Justification for implementing nursing interventions:
physical activity: lack of physical activity can lead to hyperlipidaemia/being overweight/obesity. Smoking causes vasoconstriction and myocardial hypoxia, doubling the risk of myocardial infarction. Dietary treatment of hyperlipidaemia can inhibit progression and cause at least partial regression of atherosclerosis, fats should be limited to no more than 30% of caloric intake, including cholesterol 300 mg/day [12,13].
Evaluation of care outcomes and nursing interventions undertaken:
no symptoms of myocardial infarction. The problem requires further observation.

Nursing diagnosis 3:
respiratory disorders associated with coronary heart disease manifested by dyspnoea during exercise [14,15]
Purpose of care:
to correct respiratory disorders, to ensure the safety and comfort of the patient, to prevent complications [15].
Nursing intervention plan [14,15]:
- measuring vital signs (temperature, pulse, saturation, blood pressure), assessing the patient's breathing cycle and track, auscultation, and tapping the patient;
- observing the patient for severe clinical signs, such as disorientation, lethargy, bradycardia;
- ensuring microclimate: temperature 18 to 22°C and humidity 60%;
- drawing blood for laboratory tests as ordered by the doctor;
- taking a medical history;
- if necessary, supplying oxygen;
- assisting the patient to assume and maintain an elevated position (Fowler).

Justification for implementing nursing interventions:
diagnosis of tachycardia above 100/min and tachypnoea-type dyspnoea above 24/min, body temperature above 38°C is an indication for further diagnostic imaging. Arterial blood gasometry, haematocrit, glucose, urea and sodium determinations are required. Hospitalisation is

an emotional experience for the patient, accompanied by great stress and loss of security. In addition, existing psychological burdens are exacerbated in elderly patients. Observe if the patient is experiencing severe clinical symptoms in order to be able to respond quickly if the patient's condition worsens. Administration of oxygen is necessary if the patient's body is hypoxic. Adopting a high position allows for comfort and facilitates breathing [14,15].
Evaluation of care outcomes and nursing interventions undertaken:
respiratory disorders decreased. The problem requires further observation.

Nursing diagnosis 4:
reduced exercise tolerance due to reduced coronary reserve manifested by dyspnoea during exercise [12,13]
Purpose of care:
improve exercise tolerance and increase physical activity, maintain balance between oxygen demand and supply [12,13].
Nursing intervention plan [12,13]:
- providing rest between specific activities, e.g., walking;
- prophylactic administration of nitro-glycerine before planned exercise, if required by the patient's condition;
- preparing a plan of action at home (performing household chores, planning specific times of the day, scheduling tasks for the week);
- reminding the patient not to perform activities that require holding a position with the hands raised above the level of the heart for an extended period of time;
- informing the patient of the need to continue drug therapy even if side effects occur;
- observing consciousness, the nature of breathing, skin colouring and behaviour;
- controlling saturation.

Justification for implementing nursing interventions:
the posture of the trunk above the level of the heart puts pressure on the heart muscle. Side effects of the medications used may include

headaches, a drop in blood pressure or fatigue, although often after a few weeks the body adapts to the treatment. The use of nitro-glycerine helps prevent angina attacks. Resting between certain activities (such as walking) is important because it allows the patient to rest and avoid overload. Prepare a plan to allow the patient to have a better quality of life and well-being. Monitor arterial blood oxygen saturation to determine if hypoxia is present. Limiting increased physical activity prevents exacerbation of the disease and its symptoms [12,13].
Evaluation of care outcomes and nursing interventions undertaken:
physical exercise tolerance has changed slightly. The problem requires further observation.

Nursing diagnosis 5:
decrease in blood pressure after administration of coronary vasodilators manifested by feeling unwell
Purpose of care:
prevention of drug-induced hypotonia [16].
Nursing intervention plan [16]:
- administration of medications according to the order sheet: observation of their therapeutic effect and side effects;
- controlling blood pressure-hypotonia can lead to impaired myocardial function and a decrease in cardiac minute volume;
- monitoring reported complaints: skin colouration, sweating, dizziness, weakness;
- instructing the patient to limit physical activity during periods of worse mood.

Justification for implementing nursing interventions:
observation of therapeutic and side effects allows the nurse to respond if adverse effects occur, such as changing the dose or discontinuing the drug. Monitoring blood pressure is necessary because hypotension leads to impaired myocardial function and reduced cardiac minute volume, which in turn results in whole body dysfunction. Monitoring these symptoms allows the nurse to identify any abnormalities in the patient's condition and take appropriate action. The patient's alertness is designed

to draw attention to the patient's deterioration, limiting physical activity can prevent fatigue and reduce the burden on the heart [16].
Evaluation of care outcomes and nursing interventions undertaken:
blood pressure measurements are normal. The problem requires further observation.

Nursing diagnosis 6:
risk of falling resulting from syncope and dizziness due to cerebral hypoxia
Purpose of care:
reduce the risk of falls [15].
Nursing intervention plan [15]:
- patient history: frequency and circumstances of falls, type of activity of the patient before the fall, state of consciousness and cognitive processes during the accident, medications used, functional fitness;
- performing measurements/tests, such as Performance of orthostatic test, Visual and auditory examination;
- improving the patient's sense of security and enhancing their functioning by discussing safeguards during activities of daily living, indicating the need for modification aimed at eliminating external factors that contributed to the fall, familiarising the patient with fall techniques to reduce injuries;
- creating therapeutic contact by showing acceptance, respect and patience;
- active listening.

Justification for implementing nursing interventions:
the selection of studies should be based on an analysis of interviews, history of falls, circumstances of falls, illnesses and symptoms occurring before, during and immediately after falls, as well as analysis of treatment used, with particular emphasis on the number of falls and medications taken.

Feeling safe is a fundamental part of preparing for self-care and reducing anxiety. Eliminating environmental factors contributes significantly to reducing the risk of falls. An important factor is the control of

anxiety on the basis of which "post-fall syndrome" develops, leading to restriction of motor activity [15].
Evaluation of care outcomes and nursing interventions undertaken:
the patient did not fall. The patient is assured of a sense of security.

Nursing diagnosis 7:
anxiety, fear for life resulting from angina complaints and current health manifesting itself in psychomotor restlessness [14,15]
Purpose of care:
to minimise fear and anxiety. Calming the patient [14,15].
Nursing intervention plan [14,15]:
- eliminating factors that exacerbate negative emotions (e.g. noise, rushing);
- staying with the patient frequently and encouraging the patient through empathy, respect, gaining the patient's trust, active listening, reinforcing the patient's self-image;
- informing the patient in the hospital setting about the activities performed, their sequence and the importance of treatment and care;
- answering the patient's questions within the scope of nursing competence;
- reassuring the patient and improving his/her functioning by recognizing the patient's main difficulties in adjusting to a new situation, facilitating the release of unpleasant emotions, accepting the patient's limitations and coping abilities, taking care to provide professional assistance, explaining the type, purpose and timing of necessary tests, diagnostic and laboratory tests.

Justification for implementing nursing interventions:
during contact with a patient experiencing anxiety, a transfer situation may occur. Therefore, it is important for the nurse, as well as members of the therapeutic team, to be aware of their feelings and emotions. Therapeutic contact can help manage the patient's anxiety and feelings of helplessness and affect the quality of the patient's experience. Relationships based on trust, empathy and taking the patient's concerns seriously are essential for a good therapeutic relationship [15].

Evaluation of care outcomes and nursing interventions undertaken:
the patient received support. The state of fear and anxiety has been reduced.

Nursing diagnosis 8:
long-term exhaustion caused by insomnia, manifested by feelings of lack of strength, headaches and deterioration of intellectual performance
Purpose of care:
eliminate symptoms of chronic fatigue.
Nursing intervention plan [15]:
- communicating with the patient, gaining the patient's trust, encouraging the patient to express emotions related to perceived concerns and symptoms of chronic fatigue;
- analysing the impact of chronic fatigue on the patient's health and functioning;
- collaboratively establishing an action plan leading to fatigue reduction: setting realistic, short-term goals, introducing time management techniques, collaborating with the therapist, educating the patient on healthy lifestyles, including nutrition, physical activity, proper amount and quality of sleep.

Justification for implementing nursing interventions:
communicating with patients and gaining their trust can help reduce anxiety and engage them. Basic psychotherapeutic communication should be part of a holistic approach to the patient and be based on interpersonal skills. Assessment of fatigue symptoms helps identify possible causes and chronic fatigue syndrome. Problem-solving oriented interventions lead to a reduction in the frequency of feelings of fatigue. The use of cognitive-behavioural therapy techniques helps patients understand the impact of thinking on their feelings and behaviour, which contributes to a positive impact on fatigue levels, work and adjustment. A well-balanced diet provides the body with the necessary nutrients to function properly. Fatigue, weakness and decreased energy can result from dietary errors [15].

Evaluation of care outcomes and nursing interventions undertaken:
the patient's well-being improved minimally. The feeling of fatigue and weakness was slightly reduced.

Nursing diagnosis 9:
decreased sense of satisfaction with life in the course of chronic disease (ischemic heart disease) manifested by decreased well-being
Purpose of care:
improve well-being and increase life satisfaction [15].
Nursing intervention plan [15]:
- assessment: patient's satisfaction with life, patient's health status, patient's social context, factors contributing to a decline in life satisfaction;
- empathic treatment of the patient, talking to the patient during illness;
- assessing the patient's knowledge of self-care;
- examples of supportive activities that promote the patient's self-image, such as acknowledging the patient's own thoughts, feelings, desires, behaviours, accepting the patient's strengths and weaknesses, successes and failures;
- providing emotional support to the patient to encourage him or her to take positive health-related actions;
- motivating the patient to engage in self-care and activity.

Justification for implementing nursing interventions:
assessment of life satisfaction and initial health and psychosocial status is the basis for effective action. It is necessary to identify factors that contribute to decreased life satisfaction. An empathetic approach facilitates a positive relationship with the patient, builds trust, and enables the patient's emotions and problems to be noticed. Knowing the patient's knowledge of the disease and care facilitates care planning and education. Self-esteem is very important in the self-care process, as it influences the implementation of health-promoting measures. Through research, it can be concluded that supporting the encouragement of patients to engage in self-care and treatment improves patients' self-efficacy

and satisfaction. Implementing the planned interventions and achieving positive outcomes is possible when patients are motivated [15].
Evaluation of care outcomes and nursing interventions undertaken:
the patient begins to feel greater satisfaction with life. The problem requires further observation.

Nursing diagnosis 10:
inadequate family preparation for patient care, resulting in undue burden on caregivers and disorganisation of family life
Purpose of care:
to prepare the family to care for a patient with coronary artery disease, reduce family discomfort caused by stress and improve family functioning [15].
Nursing interventions [15]:
impart knowledge to the patient's family regarding the essence of ischemic heart disease, its course and diagnosis, training the family in pharmacotherapy and rehabilitation, providing access to necessary medications and rehabilitation equipment, arranging regular visits by the doctor and other specialists to monitor the patient's condition, creating a safe home environment for the patient.
Justification for implementing nursing interventions:
information provided to family members about the nature of the disease is intended to make them aware of their role in the management of the coronary heart disease patient and to facilitate their role as informal caregiver. A safe mental and physical environment is a prerequisite for proper home care of the patient [15].
Evaluation of care outcomes and nursing interventions undertaken:
support was provided to the patient and his family. The family slowly implements the above-mentioned activities.

Conclusions

The following health problems/nursing diagnosis can be distinguished in a patient with coronary artery disease: the occurrence of coronary pain,

decreased exercise tolerance, the occurrence of shortness of breath during physical activity, feelings of prolonged fatigue, falls, fainting, anxiety, lack of satisfaction with life. The family additionally shows a lack of preparation for the patient's care.

A patient with coronary artery disease experiences fatigue and decreased exercise tolerance, which translates into difficulty in daily functioning.

Coronary artery disease negatively affects the patient's psychosocial state, the patient experiences anxiety and reduced satisfaction with life.

In the situation of the patient's knowledge deficit related to the therapeutic process, it is necessary to educate the patient, the main goal of which is to increase awareness, the patient's activity in the therapeutic process and reduce the feeling of anxiety.

The patient should be informed about the role of proper nutrition and the impact of risk factors on worsening the course of the disease.

The nurse's role in caring for a patient with coronary artery disease consists of several tasks: educating the patient, providing guidance supported by medical knowledge, help with self-care, and showing empathy, support and providing a sense of security.

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