

# **NURSING DIAGNOSES IN A PATIENT WITH HEMOLYTIC ANEMIA DUE TO POOR FUNCTIONING OF THE BIOLOGIC MITRAL VALVE, ACCORDING TO CALLISTA ROY'S ADAPTATION THEORY AND THE NANDA'S TAXONOMY**

## **II**

Eduarda Ribeiro dos Santos, RN, MSc

**Introduction** Hemolytic anemia due to poor functioning of the biologic mitral valve happens when the spinal cord is not capable to compensate for, by increasing production, the premature destruction of the blood red cells. It is characterized by a massive or a very rapid destruction of the blood red cells by hemolysis. This destruction or hemolysis can be due to the blood red cells' excessive frailty (thalassemia) or to hyperactivity of the reticular-endothelial system (mainly the spleen). Thus, in hemolytic anemia the erythrocytes have a short life. The spinal cord generally compensates for it by partially producing new blood red cells three times faster than the normal rate, or beyond the normal rate. This is an atypical disease because it shows a variety of signs and symptoms which manifest differently in each patient. Thus, we can find very critically ill patients, and patients with a benign evolution, that is, they do not show complicated symptoms of the disease. The poor functioning of the patient's prosthesis evolves to hemolysis due to trauma to erythrocytes; they can undergo hemolysis by fragmentation when exposed to excessive mechanic stress in the intravascular medium, or along their extracorporeal circulation.. Abnormal wearing forces show up during erythrocytes' passage through proteic cardiac valves, injured natural valves or vascular shunts. Actually, chronic intravascular hemolysis due to abnormal function of cardiac valves or valve prostheses is relatively rare. Generally, its occurrence points to the presence of a dysfunctional valve due to major wearing stresses related to systemic pressures. This kind of intravascular hemolysis is more often caused by dysfunctional aortic valves, although the occurrence of similar syndromes has also been noticed in the presence of a mitral valve pathology. Nurses have to refer to more useful theories or models for the given situation. A nursing diagnosis is a clinical judgement of the individual's, the family's or the community's responses to actual or potential (risk) health problems, and to vital processes which make the foundation to select the nursing interventions to

achieve the outcomes the nurse is committed to. The nursing process is a problem-solution approach to meet the nursing needs and the individual's healthcare needs. The nursing process elements used in Roy's Theory include: behavior investigation; stimulus investigation; nursing diagnosis; aims setting; intervention, and evaluation. The stimuli are the feeding data, divided into focal stimuli (immediately faced by the individual, thus causing a major degree change); context stimuli (internal or external stimuli, negative or positive stimuli about the situation), and trace stimuli (internal and external features not clarified yet). These three kinds of stimuli are then combined, and they set an adjustment level for the individual. (coping mechanism), which is always changing. The responses are the moments this individual leaves the system, and they represent the person's behavior. They can become a feedback either for the individual and the environment. The responses can be adaptive (they promote the individual's integrity) and ineffective (they do not achieve the aims of survival, growth, reproduction and mastery). In this particular case, the blood red cells' lysis was the focal stimulus, due to a dysfunctional valvar prosthesis, with the consequent decrease of hemoglobins and hematocrits. The context stimuli were a decreased tissue oxygenation, a probable trace stimulus, and tabagism. The ineffective reactions were pruritus, dyspnea, fatigue, **coluria**, jaundice, dry skin, renal failure, hepatomegaly, extremity cyanosis. **Objectives:** To identify the major nursing diagnoses for this patient with hemolytic anemia, due to poor functioning of the biologic mitral valve, in a large Public General Hospital of the *Grande São Paulo*, based on the Taxonomy II, of the North American Nursing Diagnosis Association (NANDA), and on Roy's adaptation theory. **Methodology:** Data were collected from August to October 2006 along the investigation, having Calista Roy's theory as its basis. A careful physical assessment and a survey of the case-related nursing diagnoses were carried out. We report the case of CVO, 44 years old, female, married, two children, elementary school level, catholic, Brazilian, from São Paulo City - SP. She was admitted for treatment with a medical diagnosis of Hemolytic Anemia caused by a poor functioning of the biologic mitral valve. She underwent an implant of a mitral valve prosthesis (swine pericardial biologic valve) 14 years ago (mitral valve sthenosis), and a 20-year-old tabagism (a packet/day); she has not smoked for 1 year. She lives in an apartment in an urban area with sanitation,

and she works with sales, thus being standing most of the day. Physical activity is not part of her life; she enjoys traveling and magazine reading. For breakfast she has coffee and milk with bread; for lunch she has rice and black beans, meat and vegetables; she has some fruit in the afternoon, and soup for dinner. Urinary and bowel eliminations are normal, as well as her menses. Sexually active. Good social interaction and religion beliefs (catholic); she has health insurance and needs help only for a few daily activities. She is optimistic about the treatment. She has faced problems with her body image and avoided looking herself in the mirror; she has resisted to shower, nail and hair care. She was awake and conscious during physical assessment, and stated that has awakened many times a night in the hospital and took naps along the day. Light-reacting pupils, ambulatory, pale ++++/4+, presence of jaundice +++/4+, dry oral mucosa membrane and skin, with generalized pruritus, dry and brittle hair, normal skull. She reported pondered weight loss (10 kg along 3 months). She showed decreased visual acuity (Nearsightedness and Astigmatism), although she does not wear contact lenses; bilateral exophthalmia; epistaxis for 4 days; oral cavity with missing teeth, and presence of cavities. No abnormalities in the neck; normal chest, and symmetrical breasts. Pulmonary auscultation revealed bilateral MV+ w/ RA; she keeps herself in environment air. Arrhythmic heart, with the presence of systolic murmurs, and unchanged precordial. Genitourinary system with no anatomical changes, with SVD with hematuric output (2,000ml/day); she shows yellowish odorless exudate in the urinary meatus. Flat and soft abdomen, hepatomegaly (4-5 cm of the back fringe), RHA+. Upper extremities with peripheral pulses; peripheral venous device in MSE; pervious, and with no signs of infection; light extremity cyanosis; decreased peripheral capillary perfusion. Lower extremities with peripheral pulses and mobility. Arterial blood pressure: 140 x 80 mmHg at 180 x 80 mmHg. Pulses: 90 to 120 bpm. Temperature: 37<sup>0</sup>C to 37.5<sup>0</sup>C. Respiratory rate: 22 to 29 ipm. Weight: 47 kg. Height: 1.58 cm. Laboratory data: erythrocytes (1.47 milh/mm<sup>3</sup>) signaling anemia related to cell destruction; decreased levels of hemoglobin (4,4 g/dl), which signals anemia and hemolytical responses; hematocrits at 12% also mean the presence of anemia; glycosis level of 125 mg/dl; increased creatinine level (3.7 mg/dl); urea of 123 mg/dl. She was given two units of blood red cells packet (250 ml, O+ type) on admission. Prescribed

medicines: hyposodic diet; Ringer's lactate, with 125 mL/h of continuous physiological solution by infusion pump; intravenous Mannitol at 20% every 6 hours; oral Captopril 25 mg every 12 hours; sodic levotiroxin 100mg, 1 tablet early before breakfast; 1 tablet early of oral 0.25 mg Digoxina; Paracetamol and codeine phosphate 30 mg, 1 tablet orally, if necessary; 40 mg Omeprazol intravenously every 6 hours. **Results:** The noticed responses allowed us to divide the nursing diagnoses into four adaptive modes, resulting from the coping mechanisms (regulatory and cognate). They included: physiological mode, selfconcept mode, role function mode, and interdependent mode. In this investigation, and mainly for this particular patient, the pertinent diagnoses were the physiological mode and the selfconcept mode diagnoses. Physiological Mode: oxygenation – Impaired Gas Exchange, characterized by dyspnea; abnormal skin color (dark); tiredness after small efforts; fatigue; cyanosis, related to impaired ventilation and perfusion. *Ineffective Tissue Perfusion: Renal*, characterized by increased urea rates (123 mg/dl), and creatinine level (3.7dL); altered blood pressure, and pruritus, related to hypervolemia, mechanical decrease of the venous and arterial blood flux, and impaired oxygen transportation through the alveolar-capillary membrane, due to decreased blood hemoglobin concentration. *Ineffective Tissue Perfusion: Peripheral*, characterized by cyanosis; pale skin; hair loss; dry skin; dry and brittle hair; generalized pruritus; capillary refill longer than 3 seconds (arterial), related to hypervolemia, impaired oxygen transportation through the capillary membrane, decreased concentration of blood hemoglobin, mechanical decrease of the venous and arterial blood flux. *Ineffective Respiratory Pattern*, characterized by dyspnea under light efforts; use of respiratory accessory muscles; respiratory rate of 29 ipm, related to fatigue, decreased hemoglobin, thus making gas exchanges difficult, due to the medullar production of imature cells. *Decreased Cardiac Output*, characterized by tachycardia; edema; cold skin; dyspnea; fatigue; longer peripheral capillary perfusion; changes in skin color, related to poor function of the mitral valve (altered preload), and altered cardiac rate (90 bpm). Physiological Mode: Nutrition – Nutrition, altered: less than body requirements, characterized by reports of inappropriate food ingestion; pale conjunctive and mucosa membranes; weight loss; excessive hair loss, related to dehydration and appetite loss. Physiological Mode: Activity and Rest –Sleep

*Pattern Disturbance*, characterized by many awakening episodes through the night; decreased functional capacity; verbal complaints of difficulty to fall asleep, and not feeling rested in the morning, related to anxiety and separation of significant others *Fatigue*, characterized by increased rest needs; perceived need of additional energy to perform daily activities; expressed constant and oppressive lack of energy, related to decreased blood hemoglobin, and poor nutrition. *Activity Intolerance*, characterized by fatigue; weakness; dyspnea by effort; abnormal response of cardiac rate, and extremity cyanosis, related to bed rest, unbalance between oxygen demand and supply, due to anemia.

Physiological Mode: Protection – Impaired Skin Integrity, characterized by generalized pruritus; dry skin, and dehydration, related to jaundice, fatigue, with physical immobility and altered circulation. *Risk for Infection*, related to invasive procedures (change of the mitral valve); inappropriate secondary defenses (decreased hemoglobins); inappropriate primary defenses (skin breakdown – peripheral venous access – indwelling vesical catheter). Selfconcept Mode: Disturbed Body Image, characterized by expressed feelings that reflect an altered vision of own body regarding appearance; change or loss concern; avoidance to look at a body part; avoidance to look at the mirror, related to jaundice, exophthalmia, weight loss, and hair loss. **Conclusions::** The theoretical framework at the light of Callista Roy was significant for diagnoses survey by emphasizing the psychosocial aspects and the nursing care, with a holistic individualized and humane vision which improved the patient's quality of life.