HEMODYNAMIC CHANGES AND INTENSIVE CARE TO PATIENTS WITH HEART FAILURE: A CASE STUDY

ABSTRACT
Objective: to report the hemodynamic alterations and intensive care provided to patients with heart failure. Method: descriptive study, of clinical case type, held in May 2013 in a teaching hospital in the city of João Pessoa, PB/Brazil. Medical records were used for data collection (nursing and medical record) and laboratory exams. The research project was approved by the Ethics in Research Protocol 11012512.0.0000.5183/2012. Results: dyspnoea, fatigue and edema were the main hemodynamic changes found in the patient with heart failure. The main involved intensive care are good oxygenation, hemodynamic stability, congestion relief, water control and monitoring of weight. Conclusion: It is expected that further studies are supportive and conducive to therapy of patients with HF and assist professionals in the management of HF, improving health and contributing to the quality of life of patients with this condition. Descriptors: Heart Failure; Hemodynamics; Intensive Care.

RESUMO
Objetivo: relatar as alterações hemodinâmicas e os cuidados intensivos realizados com paciente com insuficiência cardíaca. M étodo: estudo descritivo, do tipo relato de caso clínico, realizado em maio de 2013, em um hospital de ensino no município de João Pessoa, PB/Brasil. Para a coleta de dados, foram utilizados dados do prontuário (ficha de enfermagem e médica) e exames laboratoriais. O projeto de pesquisa foi aprovado pelo Comitê de Ética em Pesquisa, sob protocolo nº 11012512.0.0000.5183/2012. Resultados: dispneia, fadiga e edema foram as principais alterações hemodinâmicas encontradas no portador de insuficiência cardíaca. Os principais cuidados intensivos implicados são boa oxigenação, estabilidade hemodinâmica, alívio da congestão, controle hídrico e monitoramento do peso. Conclusão: espera-se que estudos complementares apoiem e conduzam a terapêutica dos pacientes com IC e auxiliem os profissionais no manejo da IC, melhorando a saúde e contribuindo para a qualidade de vida dos pacientes com esta condição. Descriptores: Insuficiência Cardiaca; Hemodinâmica; Terapia Intensiva.

RESULTADOS

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INTRODUCTION

Cardiovascular diseases have clinical importance both for poor prognosis as the intensity of the patient's disability to develop their daily activities, impacting their quality of life. Among cardiovascular diseases, heart failure (HF) is defined as a pathophysiological state in which heart is unable to pump blood in sufficient quantity to the organism, causing structural and functional damage to the heart muscle. The HF is the final common pathway of various diseases such as systemic arterial hypertension, diabetes and coronary artery disease.

The main clinical symptoms include dyspnea, fatigue and edema, which cause great discomfort to its carriers, with great loss of quality of life and reduced survival. In this context, HF stands out as an important worldwide public health problem, considering the growing prevalence and hospitalization rates associated with high morbidity and mortality rate.

Despite the scientific and technological advances and better socioeconomic conditions have enabled an increase in the longevity of the general population and cardiac patients, has been recorded an increased incidence of HF in the world. According to data of DATASUL, in Brazil there are about two million patients with HF, with 240,000 cases diagnosed per year. In Paraíba, there were 6945 hospitalizations of HF users, with a mortality rate for this disease of 8.45%. As a consequence, it generates a high socioeconomic cost to the country, involving medicaments spending, re-hospitalizations, productivity lost, early retirements, possible surgeries and occasionally, heart transplantation.

HF is a challenging disease to the healthcare team, due to multiple etiologies and the high incidence in the population. One of the major objectives of the health team is to achieve and maintain clinical stability of patients of a very complex treatment, which requires more investment in physical and human resources to improve the quality of life, reduce the length of hospital stay and increase survival patients.

Thereof, the present study aims to report the hemodynamic alterations and intensive care to the patient with heart failure (HF).

METHOD

Descriptive and observational study, of clinical case report type, which is a modality of study that allows the investigation to preserve the holistic and meaningful characteristics of real-life episodes, with individual life cycles and organizational and administrative processes.

The research, performed in the intensive care department of a teaching hospital in the city of João Pessoa, PB - Brazil, included a patient with heart failure, based on the particular interest in deepening the knowledge about this disease.

Data collection occurred in May 2013, after clarifications to patients and their families about the research objectives, and signing the Informed Consent Form. The instrument of data collection used was the history of nursing employed by the institution, which contained identification data, history of hospital admission, physical examination, and basic human needs information. To give subsidy to the research, information contained in medical records, laboratory tests and complications during hospitalization were used. The biochemical exams were considered as reference values accepted by the institution.

It is emphasized that the research project was approved by the Ethics Committee in Research of the University Hospital Lauro Wanderley, under n° CAAE: 11012512.0.0000.5183, in observance with Resolution No. 466/12 of the National Health
Council, which regulates research involving human beings.

RESULTS

• Case Report

J.C.A. Patient, 65 years old, male, married, has completed basic education, retired due to disability, income of 2 minimum wages, living in the municipality of Conde, PB. He was admitted to this institution on April 24, 2013, at 22:30, conducted by the Emergency Unit - UPA in the municipality of Santa Rita - PB, showing signs of decompensated heart failure. During the physical examination, it was noted that the patient was disoriented, agitated, pallid, afebrile, anicteric, dyspnea with spontaneous ventilation, MV +, AMT presence of diffuse snores, SO2 87%, tachycardia, HR of 140 bpm, regular pace heart in 2 times, decreased peripheral pulses and edema in the lower limbs. Also exhibited distended abdomen, depressed, painless, RHA + genitourinary without abnormalities and unaware of drug allergy.

In the following day of the hospitalization, the patient had two episodes of cardiopulmonary arrest (CPA) (ventricular fibrillation and asystole), was intubated and responded to resuscitation maneuvers. It began the invasive ventilatory support, with the following vasoactive drugs: norepinephrine 30 ml, dobutamine 18 ml/h, adrenaline 10 ml/h in central venous access through left subclavian vein. Installed Mean Arterial Pressure with value of 104 mmHg.

<table>
<thead>
<tr>
<th>Biochemical Exams</th>
<th>Obtained values</th>
<th>Reference values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythrocytes million/mm³</td>
<td>5.32</td>
<td>4.3 a 5.9</td>
</tr>
<tr>
<td>Hemoglobin em g/dl</td>
<td>15.1</td>
<td>13.9 a 16.3</td>
</tr>
<tr>
<td>Leukocytes per mm³</td>
<td>6.200</td>
<td>4.500 a 11.000</td>
</tr>
<tr>
<td>Sodium mmol/l</td>
<td>143</td>
<td>136 a 146</td>
</tr>
<tr>
<td>Potassium mmol/l</td>
<td>3.5</td>
<td>3.4 a 4.5</td>
</tr>
<tr>
<td>Glucose mg/dl</td>
<td>118</td>
<td>70 a 122</td>
</tr>
</tbody>
</table>

Figure 1. Biochemical exams performed in patients with heart failure.

DISCUSSION

HF is a clinical syndrome resulting from a structural or functional cardiac disorder that prejudice the ability of the ventricle to fill with or eject sufficient blood according to the demand of the body or allows only do so with increased filling pressures.9

HF affects one third of patients who are treated by the public health system in Brazil, which caters mostly older and lower-income people. It is the main cause of hospitalizations for heart problems by the public health system (293.759 hospitalizations in 2007), with annual mortality rate of about 8% and about 23,442 deaths each year.10

Recent studies have estimated that there are approximately 5 million patients with HF in the United States and each year there will be at least more than 550,000 diagnosed cases, which directly influences the need for planning and proactive health professionals to know educate and advise patients, as well as to conduct effectively the treatment.1

Among the main factors for the emergence of HF, we highlight several diseases such as hypertension, dyslipidemia and myocardial infarction that, in turn, are not controlled in a epidemiological point of view and, therefore, may explain the increased incidence of this disease.11 In addition to these, there are non-modifiable risk factors such as age, sex and genetic composition, and behavioral, such as: compounds by smoking, unhealthy diet and physical inactivity. All these risk factors together expose population to the HF.12

The HF has been categorized based on the intensity of symptoms in four classes proposed by the New York Heart Association (NYHA). These stratify the degree of limitation
imposed by the disease for the individual's daily activities, as well as having functional character, assess the quality of life of patients facing their illness. The four proposed classes are: Class I - absence of symptoms (dyspnea) during daily activities. The limitation to efforts is similar to that expected in normal individuals; Class II - symptoms triggered by everyday activities; Class III - symptoms triggered in less intense activities that daily or mild exertion; Class IV - symptoms at rest.13

Once installed, this disease has a strong impact on quality of life of the patient, which may be explained by limitations due to physical and psychological symptoms associated with the syndrome. For signs and symptoms of the patient under study, at hospitalization, the presence of edema was identified more frequently, complaints of dyspnea and fatigue. These findings are in agreement with the clinical data from patients admitted with decompensated HF, giving congestive status, the most important cause of hospital admission.14

In patients with HF, the sensation of dyspnea may be related to abnormalities in respiratory muscle function. Studies report a reduction in respiratory muscle strength that contributes to the sensation of dyspnea. Although the specific mechanisms that cause changes in lung function in HF are not fully understood, these changes have been attributed to respiratory muscle weakness, to the chronic pulmonary congestion and hypertension, as well as changes in lung balance and neuro-humoral changes.15

Due to decreased cardiac output and ejection fraction, HF causes low tolerance to exercise with marked metabolic and respiratory responses, which leads the subject to inactivity, causing muscle atrophy associated with fatigue and decrease in muscle strength. The compromised heart causes failure in the blood pumping, leading to lung abnormalities such as pulmonary hypertension and decreased ventilatory capacity with worsening symptoms and cardiorespiratory fitness.15

Another prominent manifestation is the increased intravascular volume due to reduced of cardiac output. The increase of pulmonary venous pressure can cause pulmonary edema, evidenced by cough and dyspnoea. The high systemic venous pressure, in turn, can result in widespread peripheral edema.7

The intensive care management and treatment of HF have as main objective to promote rapid improvement of symptoms, without worsening renal function. Therefore, interventions are based on three pillars: tissue oxygenation, hemodynamic stabilization and congestion relief.16 The use of oxygen aims to maintain adequate O2 saturation above 90%. In the case of pulmonary congestion, the positive continuous pressure of airways areas (CPAP or BIPAP) is recommended to be an effective and non-invasive measure to achieve the desired saturation.16

Patients with HF should take care of their weight daily, restricting sodium and fluid, realization of physical activity, medication use, monitor for signs and symptoms of worsening of the disease and follow-up with the team.17 In the biochemical examination of the patient under study, there was no predictive factor that could compromise the clinical condition from electrolyte disturbances. It is emphasized the importance of the impact of electrolytes for HF. As for sodium, attention should be paid to the presence of hyponatremia in which HF, is associated with a number of unfavorable outcomes.18 In patients with HF, the sodium intake should be at maximum 2-3g/day and may be modified according to the values of plasma sodium.5

It is noteworthy that some diuretics used to treat HF can lead to potassium and magnesium depletion. The hypokalemia is
associated with anorexia, nausea and vomiting, abdominal discomfort and cardiac arrhythmias. Magnesium deficiency in turn, causes a positive sodium balance, and negative potassium. Therefore, these ions should be monitored frequently in patients with HF. Although hemoglobin levels are normal, anemia is a risk factor for various cardiovascular outcomes. Iron deficiency is the most common nutritional deficiency in heart diseases. The physiological response to anemia triggers a compensatory increase in cardiac output, through increases in blood volume, preload and heart rate.

Nursing helps to control fatigue with interventions that aim to improve the resilience of the patient and including health assessment, control of nutrition, prescribed activity/exercise, prescribed diet, establishing mutual goals, identifying risks, increasing sleep, promotion of exercise. Water restriction should be according to the clinical condition of the patient, valuing the dose of diuretics on average to the fluid intake that is suggested from 1000 to 1500 ml in symptomatic patients on risk of hypervolemia.

The monitoring of weight is a simple task that can help in the evolution of volume status and response to diuretic therapy in patients with HF. Another action that helps the nursing care plan is to identify the physical, psychological, social and spiritual needs, as well as view the patient holistically, promotes more individualized care. Despite the growing recognition of the importance that the IC has acquired in our midst, there is a lack of epidemiological, clinical and therapeutic data about the disease, which complicates the definition of priorities for developing preventive strategies.

Frequent hospitalizations are caused by the exacerbation of signs and symptoms of HF and constitute a challenge for the management of patients. Data in the literature show high rates of readmissions in the first six months after hospital discharge, and are considered the first 30-90 days as the most critical periods, with readmission rates ranging 29-47%, resulting in high costs for the health system.

Another factor that we can highlight is the little knowledge about the HF, unskilled monitoring by a multidisciplinary team, or even the lack of systematic guidance. Health education is needed to understand the health-disease process and the knowledge acquired by the patient promote self-care, reducing hospital readmission rate.

CONCLUSION

The FH is a complex, multifactorial syndrome that causes a series of complications that affect the functional ability of health of the individual with this disease, changing the quality of life. The purpose of the study was achieved by discussing the hemodynamic changes and the main intensive care offered in clinical work and take care to patients affected by heart failure.

The findings corroborate with the literature highlighting the main hemodynamic changes: dyspnea, fatigue, and pulmonary congestion. The main intensive care are based on good ventilation, the control of pulmonary congestion and hemodynamic stabilization.

The limitation of this study versa about the sample involved, but was sensitive to individuality, we suggested that further studies would be conducted, extending the sample to guide and lead to therapeutic professionals involved in the management of HF, improving health and contributing to quality of life of patients with this condition.

REFERENCES

1. Corrêa AG, Paes LM, Yokota PKO. Protocolos gerenciados de infarto agudo do...


Sousa MM, Araújo AA de, Barros MAA MF et al.


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