

Case Study Analysis

Student's Name

Institutional Affiliation

Week 4 Assignment: Case Study Analysis

Overview

The cardiovascular and cardiopulmonary systems are interdependent, powered by the heart's dual pumps that circulate oxygenated blood through the body (McCance & Huether, 2019). Normally, these systems function seamlessly. However, when one part fails, it disrupts the entire system.

A 76-year-old female with a history of Congestive Heart Failure (CHF) presents with weight gain, shortness of breath, peripheral edema, abdominal swelling, and orthopnea. The patient reports non-compliance with her diuretic regimen.

Pathophysiologic Process Dysfunction Interaction and Patient Presentation

Heart failure (HF), as described by Inamdar & Inamdar (2016), is a clinical syndrome caused by structural and functional defects in the heart, leading to impairments in the left ventricular (LV), right ventricular (RV), or both. Hypertension and ischemic heart disease are the leading risk factors for HF. Most HF cases are due to LV dysfunction, though other heart components like the myocardium, valves, and major vessels also play a role (McCance & Huether, 2019). HF is categorized into HF with preserved ejection fraction (HFpEF) and HF with reduced ejection fraction (HFrEF).

In HFrEF (systolic dysfunction), the heart's ejection fraction is less than 40%, leading to insufficient tissue perfusion due to decreased cardiac output, often following myocardial infarctions. Ventricular remodeling, involving inflammatory and immune responses, disrupts the heart's normal structure, causing progressive dilation and increased preload, worsening HF. Symptoms include dyspnea, orthopnea, cough with frothy sputum, fatigue, reduced urine output,

and edema due to pulmonary congestion and poor systemic circulation (McCance & Huether, 2019).

HFpEF (diastolic dysfunction) commonly affects older women and involves pulmonary congestion despite normal cardiac output. Major causes include hypertension-induced myocardial hypertrophy, ischemia, and ventricular remodeling. These changes impact the LV's compliance and the RV's relaxation, contributing to pulmonary edema (McCance & Huether, 2019). In right-side HF, the RV cannot pump blood effectively into the pulmonary circulation, often due to increased LV filling pressure, leading to RV hypertrophy and eventual failure. This results in symptoms like jugular venous distention, ascites, hepatic congestion, and peripheral edema. The patient's symptoms, such as SOB, orthopnea, ascites, weight gain, and peripheral edema, indicate chronic right-side HF secondary to left-side HF, exacerbated by her current condition. Educating the patient about proper diuretic use, salt intake reduction, daily weight monitoring, and record-keeping can help manage her symptoms better.

Racial/Ethnic Variables

Genetic factors such as cardiomyopathies, sarcomere proteins, and neurohumoral receptors increase the risk of HF (McCance & Huether, 2019). Although heart disease affects all races, African Americans and Hispanics have a higher prevalence of HF than Whites. African American women, in particular, have the highest incidence of HF in the United States (Breathett, 2020). A study by Bahrami (2008) found that African Americans have a significantly higher risk of developing CHF compared to Whites, largely due to higher rates of hypertension and diabetes. Additionally, socioeconomic and behavioral factors contribute to higher CHF morbidity rates among African Americans (Durstefeld et al., 2016).

Conclusion

Although HF has no cure, adopting a healthy lifestyle—such as quitting smoking, eating well, and exercising—can help prevent its development. Risk factors like obesity, smoking, hypertension, and diabetes play significant roles, but genetic predispositions are also crucial. HF significantly impacts the quality and quantity of life, making prevention and management essential.

References

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