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Effects of Enhanced Counter Pulsation Therapy on Patients with Angina

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Pathophysiology

Angina pectoris is a clinical syndrome of pre-syndromic discomfort or pain due to transient myocardial ischemia without infarction (Warnica, 2015). Plaque disruption, thrombosis, vasoconstriction, and supply-demand mismatch are all contributory factors related to unstable angina (Medscape, 2013). Angina pectoris occurs as a consequence of increased cardiac workload, subsequently myocardial oxygen demand exceeds the capability of the coronary arteries to supply an adequate volume of oxygenated blood (Warnica, 2015). Myocardial oxygen demand is primarily determined by heart rate, contractility, narrowing of a coronary artery typically results in angina that occurs during exertion and is relieved by rest (Warnica, 2015). Unstable angina falls within the realm of clinical presentations referred collectively as acute coronary syndromes (ACS), ranging from STEMI (Sharma et al., 2013) to non-STEMI (Medscape, 2013). The patient experiencing ACS should be diagnosed with refractory angina when there is no detectable release of enzymes and biomarkers of myocardial necrosis (Medscape, 2013).

Signs & Symptoms

The NIH describes angina as chest pain and discomfort that occurs if the heart muscle does not get enough oxygen-rich blood. The pain associated with angina is often described as squeezing or pressure in the chest, the pain may radiate to the jaw, shoulders, arms, and neck (NIH, 2013). Signs and symptoms associated with refractory angina may vary significantly among patients. A 62 year old female diagnosed with chronic angina presented with sharp chest pain radiating to the neck and back. The patient reported a decrease in angina symptoms, however, the angina persisted despite standard pharmacological interventions. In addition to medication treatment, the patient underwent two coronary artery bypass graft surgeries, and developed a mechanical valve replacement. Despite continued efforts, the patient reported a decrease in anginal chest pain and associated anxiety with angina occurring, affecting all aspects of the patient’s life. With all other treatment options exhausted, enhanced external counterpulsation (EECP) therapy was recommended. The treatment was non-invasive, painless, and beneficial. After one month of continued EECP treatment new collateral veins were noted to several areas of the heart. The patient reported a decrease in anginal symptoms. Additionally, a reduction in pharmacological treatment was noted.

Significance of Pathophysiology

The nurse should be familiar with the pathological process that occurs in the patient suffering from refractory angina. Becoming familiar with the signs and symptoms associated with the disorder will enable the nurse to provide accurate and timely care. The advanced practice nurse must understand that the patient may present atypical symptoms that are often mistaken for a MI. The nurse must be familiar with cardiac enzyme testing. With proper knowledge, the nurse can distinguish angina from a MI. Knowledge of lab values is significant, as certain enzymes will be negative in the patient with refractory angina.

Case Presentation

A 62 year old female diagnosed with chronic angina presented with sharp chest pain radiating to the neck and back. The patient reported a decrease in anginal chest pain and associated anxiety with angina occurring, affecting all aspects of the patient’s life. With all other treatment options exhausted, enhanced external counterpulsation (EECP) therapy was recommended. The treatment was non-invasive, painless, and beneficial. After one month of continued EECP treatment new collateral veins were noted to several areas of the heart. The patient reported a decrease in anginal symptoms. Additionally, a reduction in pharmacological treatment was noted.

Implications of nursing care related to ECP

In June 2002, the United States Food and Drug Administration (FDA) approved enhanced external counterpulsation (EECP), as an effective treatment for the management of refractory angina (Sharma et al., 2013). EECP is a non-invasive treatment in the frequency regulation and intensity of angina episodes. During EECP three pairs of pneumatic cuffs are applied to the lower extremities at the level of the calves and lower and upper thighs, cuff inflation and deflation are synchronized with the ECG (Kohn, 2010). Typically, the patient will receive fifteen to thirty hours per week over the course of seven weeks (Kohn, 2010). EECP treatment requires three sets of pneumatic cuffs that sequentially contract during diastole, and automatically deflate before onset of systole (Kohn, 2010). This process increases aortic diastolic pressure, while enhancing coronary blood flow and central venous return (Sharma et al., 2013). Simply speaking, EECP increases the volume of blood returning to the heart, which helps supply more oxygen to its starved areas, therefore reducing angina (Medscape, 2013).

Conclusion

According to the data, the number of patients diagnosed yearly with refractory angina continues to increase. Pain reduction in this patient population is a significant issue faced by clinicians. EECP is an effective, noninvasive treatment option for the patient suffering from refractory angina. The patient described in this research study reported a 75% reduction in angina symptoms. According to the data, patients treated with EECP have a 25% reduction in angina symptoms within one week (Kohn, 2010). EECP is considered an effective treatment for the patient suffering from chronic angina (Kohn, 2010). The advanced practice nurse must become familiar with all treatment options available to the patient suffering from angina. EECP should be considered as part of the patient’s treatment plan, where pharmacological and surgical options have been exhausted. Further education to both clinicians and patient is needed with regard to this effective treatment for refractory angina.

Multiple medical professionals are unfamiliar with EECP therapy, therefore EECP is underutilized in the treatment of chronic angina. Increased provider knowledge related to EECP may provide a successful treatment option for the patient suffering from chronic angina. Research shows, EECP has been safely used in the treatment of angina for the past two decades, more recently, several publications support its efficacy (Sharma et al., 2013).

Additional Sources


References


