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Acute Respiratory Distress Syndrome (ARDS)

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**Introduction**

Acute respiratory distress syndrome (ARDS) is a severe respiratory ailment that is a chief cause of mortality for patients in the Intensive Care Unit (ICU) (Gibbons, 2015). ARDS involves the rapid development of respiratory failure resulting from various diseases or injuries to the lungs. Because it includes both short and long term complications, early detection of ARDS is beneficial to prevent its devastating course.

**Significance of ARDS**

According to Bodrykamien and Gupta (2015), there are approximately 170,000 cases of ARDS in the United States each year. As a nurse in the ICU, ARDS develops in one to two patients every two months. With a mortality rate of 40-46% (Tadman, Bibler & Salem, 2016), ARDS is a significant issue for any patient in the ICU. I choose ARDS likely because myself as well as my colleagues in the ICU suspect find any resources demonstrating the best evidence based practice in caring for patients with this disease variable.

**Pathophysiological Processes**

**Signs and Symptoms**

- Non-cardiogenic pulmonary edema, dyspnea, hypoxemia (Chiumenti, Coppola, Freis & Gott, 2016)
- Accessory muscle use, tachypnea, pallor, diaphoresis, decreased潮濕度 (Carucci, Graf, Simmons, & Carubbia, 2014)
- Respiratory alkalosis initially on arterial blood gas (Carucci, Graf, Simmons, & Carubbia, 2014)

As breathing increases, respiratory accidents will ensue (Carucci, Graf, Simmons, & Carubbia, 2014).

**Underlying Pathophysiology**

- Three phases of ARDS
- Acute exudative phase: Injury to the endothelium, composed to type I and type II cells, occurs (Carucci et al., 2014).
- The injury results in spaces between endothelial cells which results in increased permeability and warrants alveolar flooding with protein rich fluid (Carucci et al., 2014).
- According to (Carucci et al., 2014), injury to the endothelium also causes damage to the type II microvascular bed, which leads to a reduction in perfusion to the lungs and overall results in impaired gas exchange.
- Injury to type II cells loses surfactant production and impairs fluid transport, which causes alveoli to collapse, and impairs gas exchange (Carucci et al., 2014).
- Neutrophils in the lungs release injurious substances, which increase the inflammatory response (Carucci et al., 2014).
- Coagulation pathways are disrupted and micro thrombi form in the lungs (Carucci et al., 2014).
- Fibroproliferative phase: Neutrophil-mediated inflammation and pulmonary edema lesions. A fibroproliferative process follows which causes a deposition of extracellular matrix, proliferating cells, and new blood vessels into the alveolar compartment (Carucci et al., 2014).
- Resolution phase: The epithelium is repaired by type II cells, which proliferate and differentiate into type I cells (Carucci et al., 2014).
- Neutrophil-mediated inflammation resolution is unclear, but apoptosis is thought to occur (Carucci et al., 2014).
- Pulmonary edema moves from the alveoli into the interstitial and protein is removed through a variety of pathways (Carucci et al., 2014).

**Implications for Nursing Care**

- Continuing research for treatments is warranted due to the high mortality of ARDS (Martin, Joseph, Mechi, & Hurford, 2016).
- Low tidal volume mechanical ventilation has shown promising results in the treatment of ARDS (Martin, Joseph, Mechi, & Hurford, 2016).
- Patients with severe ARDS in the early phase may benefit from prone positioning (Kress, 2015).
- In collaboration with physicians nurses can administer a neuromuscular blockade with initial mechanical ventilation and place patients in the prone position (Gibbons, 2015). Not all ARDS patients benefit from prone positioning (Martin, Joseph, Mechi, & Hurford, 2016).
- Biomarkers are useful as they reduce the heterogeneity of ARDS, thus enabling a better understanding of the pathophysiology in patients (Ware & Calfee, 2015).
- Advances in critical care have reduced ARDS mortality rates (Gibbons, 2015).
- Continual patient assessment is critical to evaluate the patient’s condition and response to therapy.

**Conclusion**

Many ICU nurses are challenged by patients suffering from ARDS. Often, these patients have various diseases and injuries which make it difficult to determine the appropriate therapy. Most therapies aim to enhance oxygenation. Some of the interventions include low tidal volume mechanical ventilation and placing the patient in prone position. Some assessment skills are crucial in detecting ARDS in its earliest stage to prevent its progression. Continual assessment of the patient’s condition is vital to ensure the appropriate nursing interventions are being utilized.

**References**


Baron, Rebecca M., & Levy, Bruce D. (2016). Recent advances in understanding and treatingARDS. F1000Research. DOI: 10.12688/F1000research.7646.1


