ARDS: Acute Respiratory Distress Syndrome

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ARDS Pathophysiology

The pathophysiology of ARDS primarily involves an initial lung injury followed by mechanisms that increase fluid from the pulmonary microvasculature to the alveoli (Pujol-Feria, 2014). Tissue injury disrupts this process and results in severe negative consequences, including:

- Decreased lung compliance is a result of the activation of the coagulation cascade during the acute inflammatory process. It is triggered by the release of tissue factor from the damaged lungs (Marino, 2014). The increased lung weight causes dependent zones of collapsed alveoli, decrease the compliance of the lungs and result in progressive respiratory failure, ARDS patients will typically display symptoms of the precipitating disease process as well.

Chest x-ray of ARDS patient

(Images retrieved from https://www.patient.info/s условнo постарательнo Lангпo-наrидox-Ax519z5093)

Signs and Symptoms

In order to meet the Berlin definition of ARDS, certain criteria must be met, including:

- An acute onset of respiratory distress
- Radiographic imaging showing bilateral pulmonary infiltrates
- The event is not cardiogenic in nature (Hansen & Siegel, 2016).

Increased Pulmonary Artery Pressure

Increased pulmonary artery pressure is another significant consequence of the ARDS pathophysiology. It may be caused by hypoxic vasoconstriction, positive pressure ventilation, pulmonary embolism, airway collapse, and hypercarbia (Siegel, 2016). Although cor pulmonale is rare, right ventricular dysfunction associated with pulmonary hypertension increases the mortality of ARDS (Nagelhout & Plaa, 2014).

References

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Nursing Implications

These patients are typically going to require intensive care. It is the duty of the ICU nursing staff to understand the progression, treatment, and potential complications of this disease. The ARDS patient can be incredibly complex, requiring some of the most advanced nursing top-down care approach seen in the ICU, including; advanced ventilator management, pulmonary holls, advanced hemodynamic monitoring, vasoactive medications, and neuromuscular blocking agents (Medykamien & Gupta, 2015). Of course, the ICU nurse cannot be expected to manage these patients alone. They must be adept in working as part of an interdisciplinary team, able to collaborate with physicians, respiratory therapists, and other members of the treatment team to ensure optimal therapy.

Conclusion

As of now, the only treatment for ARDS is supportive care aimed at improving gas exchange. The standard of care is lung protective ventilation strategies including low tidal volumes and limitation of positive expiratory pressure (PEEP). As well as the use of more aggressive strategies including neuromuscular blockers and prone positioning. Although these therapies are currently the only treatments shown to improve mortality, efforts are being made to identify treatments aimed at modulating the inflammatory response.

It is the responsibility of the name, and the rest of the treatment team, to be aware of the disease process, associated complications, and the most up-to-date therapy options. As a team, the various disciplines can utilize their expertise to optimize the patient’s ventilation status while treating the underlying cause. With a deeper understanding of the pathophysiology of ARDS, clinicians can better implement treatment plans to improve patient mortality.