New approaches in mechanical ventilation in acute lung injury and acute resiratory distress

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ARDS has undergone changes in terminology and definition. In the past years there has become a better understanding for the risk factors and pathophysiology of the disease. It is now obvious that neutrophils and multiple mediator cascades are the main players in the inflammatory process of the disease.In the present time, the main aim in management of this disease is to optimize gas exchange and preventing the iatrogenic propagation of lung injury. This can be achieved by the lung-protective ventilatory strategy which is based on the concepts of keeping the lung open with the least tidal volume, and optimum positive-end expiratory pressure, so as to avoid overdistension and/or atelectasis. This strategy may permit the arterial carbon dioxide to increase with precaution (permissive -hypercapnia).Recruitment maneuvers have been proposed as adjusts to pressure limited lung-protective ventilatory strategies to prevent atelectasis. Prone positioning, as well, is an attractive adjust to the recruitment maneuvers, showing -improvement in gas exchange in almost two-third of patients.Although volume targeted ventilation has been traditional approach to ventilatory support, in recent years, there has been increasing interest in the use of pressure-targeted ventilation to decrease the risk of overdistension injury. Lately newer modes have been introduced (dual modes) combining the benefits of the pressure and volume targeted ventilation. These include pressure-regulated volume control, volume support, adaptive support ventilation, and others.More emphasis has been given in the past decade to the benefits of non-invasive ventilation especially for patients with early ARDS. While new approaches have been met with controversy like liquid ventilation, other non-conventional approaches as high frequency ventilation and extracorporeal gas exchange have shown promising results.Several pharmacological adjust to lung protective ventilation has been used lately to improve the outcome of management of the disease. These drugs include inhaled surfactant, inhaled nitric oxide, inhaled prostaglandins, steroids and antioxidants.Much more research is needed to further improve our understanding of the nature of ARDS, and the various management modalities. There is evidence that combination therapies may prove to achieve better patient outcomes in the future.