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Early identification of patients at risk of acute lung injury

Authors: Gajic O et al.
URL: http://ajrccm.atsjournals.org/cgi/content/full/183/4/462
Comment: Once patients develop acute lung injury (ALI)/ARDS, there are very few therapeutic options. Therefore, identifying patients at risk of developing ALI provides us with a great opportunity of developing new therapies to prevent ALI. The Lung Injury Prediction Score (LIPS) was established from a retrospective derivation cohort study (Eur Respir J 2011; 37: 604-9). The LIPS is evaluated by the presence of risk factors and risk modifiers at the time of hospital admission. Gajic et al. report that the LIPS was used to efficiently identify patients at high risk of ALI. This may expand the opportunities to develop new strategies for prevention, or new therapies for early ALI.
Pre-hospitalization anti-platelet therapy is associated with a reduced incidence of acute lung injury

Authors: Erlich JM et al.
URL: http://chestjournal.chestpubs.org/content/early/2010/08/04/chest.10-0891.abstract
Comment: Platelet activation plays an important role in acute lung injury (ALI). Therefore, Erlich et al. evaluated the effect of pre-treatment with an anti-platelet drug (aspirin, clopidogrel bisulfate or anagrelide) in patients at risk of ALI. Pre-hospitalization anti-platelet therapy reduced the incidence of development of ALI/ARDS. Although the indications for anti-platelet therapy are limited, anti-platelet agents may be good candidates for preventing ALI.

Mucins carrying selectin ligands as predictive biomarkers of disseminated intravascular coagulation complication in ARDS

Authors: Nakashima T et al.
URL: http://chestjournal.chestpubs.org/content/139/2/296.abstract
Comment: Disseminated intravascular coagulation (DIC) is one of the severe complications of ARDS. KL-6/MUC1 is a well known biomarker for lung fibrosis, acute lung injury (ALI)/ARDS and lung cancer. Nakashima et al. discovered a sub-type of KL-6/MUC1, which carries selectin ligands. KL-6/MUC1s that carried selectin ligands were highly increased in ARDS patients with DIC, and could be novel biomarkers for this severe complication of ARDS.

A randomized clinical trial of hydroxymethylglutaryl–coenzyme A reductase inhibition for acute lung injury (The HARP Study)

Authors: Craig TR et al.
URL: http://ajrccm.atsjournals.org/cgi/content/full/183/5/620
Comment: Statins are well known to have many anti-inflammatory effects. This randomized, double-blind, placebo-controlled trial demonstrated that simvastatin may have beneficial effects in patients with acute lung inflammation (ALI) by reducing inflammation.

Recombinant surfactant protein C–based surfactant for patients with severe direct lung injury

Authors: Spragg R et al.
URL: http://ajrccm.atsjournals.org/cgi/content/full/183/8/1055
Comment: Another trial of surfactant replacement therapy in patients with lung injury has been reported. Unfortunately, this trial, using recombinant surfactant protein C with phospholipids and palmitic acid, has again failed to show any beneficial effects.
Neuromuscular blockers in early acute respiratory distress syndrome

Authors: Papazian L et al.
URL: http://www.nejm.org/doi/full/10.1056/NEJMoa1005372#t=article
Comment: This large randomized controlled trial demonstrated that early usage of neuromuscular blockers (within 48 hours) improved both 90-day survival rate and time off the ventilator, without increasing muscle weakness. They also found that there was less barotrauma in patients treated with neuromuscular blockers. These beneficial effects may be due to a reduction of ventilator-induced lung injury.

Functional disability 5 years after acute respiratory distress syndrome

Authors: Herridge MS et al.
URL: http://www.nejm.org/doi/full/10.1056/NEJMoa1011802#t=article
Comment: Outcomes in survivors of acute lung injury (ALI)/ARDS have been reported previously; however, this is a much longer follow-up of patients who recovered from ARDS. Herridge et al. found that physiological functions and physical activities were still impaired even five years after these patients recovered.

Circulating mitochondrial DAMPs cause inflammatory responses to injury

Authors: Zhang Q et al.
URL: http://www.nature.com/nature/journal/v464/n7285/full/nature08780.html
Comment: Mitochondria are believed to be endosymbionts that originated from bacteria during the evolutionary process; therefore, the structure of mitochondria is very similar to that of bacteria. During severe tissue damage, such as trauma and sepsis, mitochondrial 'damage'-associated molecular patterns (DAMPs), with evolutionarily conserved similarities to bacterial pathogen-associated molecular patterns (PAMPs), are released from injured cells into the circulation. Circulating mitochondrial DAMPs are recognized by inflammatory cells, especially neutrophils, and provoke inflammation. This may explain the mechanism of the systemic inflammatory response syndrome (SIRS) induced by tissue damage without infection.
Metabolic consequences of sepsis-induced acute lung injury revealed by plasma ¹H-nuclear magnetic resonance quantitative metabolomics and computational analysis

Authors: Stringer KA et al.


URL: http://ajplung.physiology.org/content/300/1/L4.long

Comment: Metabolomics is a new and powerful approach to the discovery of small molecule chemicals and metabolites that exist in particular pathophysiological conditions. New biomarkers and therapeutic targets are being discovered using this technique (e.g., cancer specific profiles discovered in saliva (Metabolomics 2010; 6: 78-95)). Stringer et al. utilized this technique to discover predictive biomarkers in sepsis-induced acute lung injury (ALI). Since ALI/ARDS is a heterogenous syndrome, this new approach may identify distinct metabolic phenotypes and give us better ideas for future randomized controlled trials.

Concise review: Mesenchymal stem cells for acute lung injury: role of paracrine soluble factors

Authors: Lee JW et al.


Comment: Increased knowledge about mesenchymal stem cells (MSCs) opens new therapeutic approaches in many diseases. Lee et al. have summarized the beneficial roles of MSCs in acute lung injury (ALI). ALI/ARDS may be the first pulmonary disease to which clinical cell therapy could be applied. The review by Moodley et al. in Respirology is also informative and worth reading (Moodley Y et al. Cellular therapies for lung disease: a distant horizon. Respirology 2011; 16: 223–37).