the digestive track as a VAP-preventive measure.

Steven Deem MD
Miriam M Treggiari MD PhD MPH
Anesthesiology Department
Harborview Medical Center
University of Washington
Seattle, Washington

REFERENCES

1. Muscedere J, Rewa O, McKechnie K, Jiang X, Laporta D, Heyland DK. Subglottic secretion drainage for the prevention of ventilator-associated pneumonia: a systematic review and meta-analysis. Crit Care Med 2011;39(8):1985-1991.
2. Poelaert J, Depuydt P, De Wolf A, Van de Velde S, Herck I, Blot S. Polyurethane cuffed endotracheal tubes to prevent early postoperative pneumonia after cardiac surgery: a pilot study. J Thorac Cardiovasc Surg 2008;135(4):771-776.
3. Chlebicki MP, Safdar N. Topical chlorhexidine for prevention of ventilator-associated pneumonia: a meta-analysis. Crit Care Med 2007;35(2):595-602.
4. Drakulovic MB, Torres A, Bauer TT, Nicolas JM, Nogue S, Ferrer M. Supine body position as a risk factor for nosocomial pneumonia in mechanically ventilated patients: a randomised trial. Lancet 1999; 354(9193):1851-1858.

Additional Experimental Evidence That Statins Protect Against Acute Lung Injury

Altintas and colleagues made a nice contribution on the field of acute lung injury (ALI), showing that pretreatment with simvastatin attenuates lung injury induced by oleic acid and endotoxin in mice.[1]

Although the authors cited a few papers to state that "the available studies on statins in ALI are limited,"[1] we believe that the evidence regarding the beneficial role of statins against ALI is growing. For example, our colleagues could mention another recent article that explored the impact of statin administration on the development of ALI induced by high-stretch mechanical ventilation.[2] Indeed, by implementing an isolated perfused mechanically ventilated rabbit lung model, our research team demonstrated that pretreatment with atorvastatin improves alveolar capillary permeability and hemodynamics, and thus attenuates ventilator-induced lung injury (VILI).[2] Our results were later confirmed by another contribution, which also noted that pretreatment with simvastatin protects against VILI in an in vivo murine model.[3] On the basis of the above 2 articles[2,3] it could be argued that administration of statins protects against VILI from the acute until the late phases of lung injury, through variable (not only anti-inflammatory/anti-oxidative) mechanisms.[4] Additional contributions revealing the protective role of statins against ALI induced by other stimuli, such as cotton smoke inhalation or irradiation, could also be retrieved and cited.[5]

On the other hand, the histological finding of Altintas and colleagues that animal lungs in the statin group without injurious stimulus showed vascular dilatation and stasis is interesting.[1] In our above-mentioned study we also found that the statin group without injurious stimulus had more (albeit statistically nonsignificant) intra-alveolar hemorrhage than the control (ie, no statin and non-injurious stimulus) group.[2] This finding did not correlate with any difference in pulmonary artery pressure between these 2 (ie, statin and non-injurious stimulus vs no statin and non-injurious stimulus) groups.[2] We agree with the authors that the clinical importance of this histological finding may need further investigation.

In conclusion, on the basis of the rapidly accumulating evidence, we share the concluding comment of our colleagues that clinical trials regarding the potential prophylactic value of statin administration in the prevention of ALI seem to be fully justified.

Ilias I Siempos MD
Petros Kopterides MD
Apostolos Armaganidis MD
GP Livanos and M Simou Laboratories
Evangelismos Hospital
University of Athens Medical School
and
Critical Care Department
Attikon University Hospital
Athens, Greece

REFERENCES

1. Altintas ND, Atilla P, Iskit AB, Topeli A. Long-term simvastatin attenuates lung injury and oxidative stress in murine acute lung injury models induced by oleic acid and endotoxin. Respir Care 2011;56(8): 1156-1163.
2. Siempos II, Maniatis NA, Kopterides P, Magkou C, Glynos C, Roussos C, Armaganidis A. Pretreatment with atorvastatin attenuates lung injury caused by high-stretch mechanical ventilation in an isolated rabbit lung model. Crit Care Med 2010; 38(5):1321-1328.
3. Muller HC, Hellwig K, Rosseau S, Tschernig T, Schmiedl A, Gutbier B, et al. Simvastatin attenuates ventilator-induced lung injury in mice. Crit Care 2010;14(4): R143.
4. Siempos II, Kopterides P, Maniatis NA, Armaganidis A. Protective role of statins against ventilator-induced lung injury. Crit Care 2010;14(5):441.
5. Mathew B, Huang Y, Jacobson JR, Berdyshev E, Gerhold LM, Wang T, et al. Simvastatin attenuates radiation-induced murine lung injury and dysregulated lung gene expression. Am J Respir Cell Mol Biol 2011;44(3):415-422.

The authors respond:

We have read with interest the encouraging constructive comments of Siempos and colleagues about our paper "Long-term simvastatin attenuates lung injury and oxidative stress in murine acute lung injury models induced by oleic acid and endotoxin," which was published in RESPIRATORY CARE.[1]

They especially focused on the finding of vascular dilatation and stasis in animal lungs in the statin pretreatment group without injurious stimulus. The clinical importance of this histological finding may need to be discussed. We have some "unpublished data" that supports the beneficial effects of simvastatin even on healthy animals (Fig. 1).

An interesting and very important finding was the higher mesenteric artery indices in mice that received only simvastatin (2 mg/kg/d in a volume of 10 mL/kg, for 15 d), compared to those that received only saline injections. This unknown vasodilatory action of simvastatin and also the observed vascular dilatation and stasis in lungs (in the manuscript) can be explained with some valuable previous works. It was demonstrated that statins up-regulate endothelial nitric oxide synthase (eNOS) activity and nitric oxide (NO) production by increasing eNOS expression (and eNOS mRNA stability) after hypoxic conditions and even under baseline conditions.[2,3] The ability of statins to exert this effect on eNOS expression was independent of cholesterol concentrations, which revealed one of the most significant pleiotropic effects of acute statin therapy.[4] This increase in physiological,

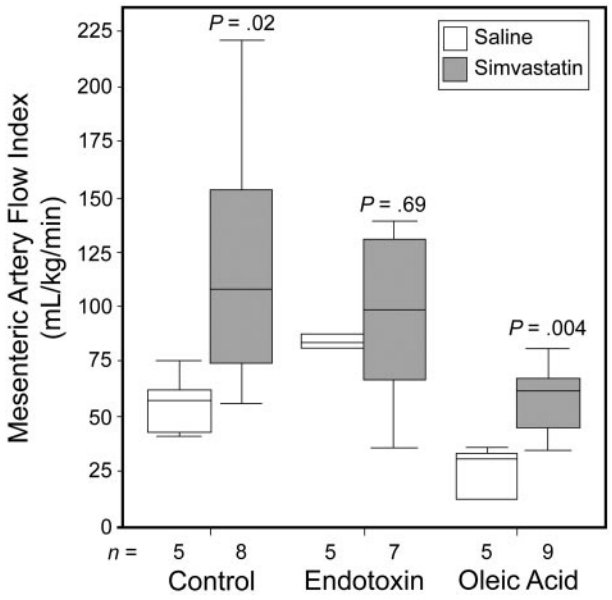

Fig. 1. Mesenteric artery flow indices in saline, endotoxin, and oleic acid-treated groups. Mesenteric artery flow index increased in mice after endotoxin injection, whereas it decreased in mice after oleic acid injection, as compared to the control group, which received saline ($P = .028$ and $P = .009$, respectively). Pretreatment with simvastatin resulted in higher mesenteric flow indices in the control and oleic acid groups.

baseline NO production may be the explanation of these beneficial effects of simvastatin.

We hope the vasodilatory effect of chronic simvastatin therapy in healthy animals will also be supported with clinical studies in humans.

Neriman Defne Altintas MD
Pergin Atilla MD
Alper Bektas Iskit MD
Arzu Topeli MD
Hacettepe University Faculty of Medicine
Ankara, Turkey

REFERENCES

1. Altintas ND, Atilla P, Iskit AB, Topeli A. Long-term simvastatin attenuates lung injury and oxidative stress in murine acute lung injury models induced by oleic acid and endotoxin. Respir Care 2011;56(8):1156-1163.
2. Laufs U, La Fata V, Liao, J.K. Inhibition of 3-hydroxy-3-methylglutaryl (HMG)-CoA reductase blocks hypoxia-mediated down-regulation of endothelial nitric oxide synthase. J Biol Chem 1997;272(50):31725-31729.
3. Laufs U, La Fata V, Plutzky J, Liao, J.K. Upregulation of endothelial nitric oxide synthase by HMG CoA reductase inhibitors. Circulation 1998;97(12):1129-1135.
4. Kureishi Y, Luo Z, Shiojima I, Bialik A, Fulton D, Lefer DJ, et al. The HMG-CoA reductase inhibitor simvastatin activates the protein kinase Akt and promotes angiogenesis innormocholesterolemic animals. Nat Med 2000;6(9):1004-1010. Erratum in: Nat Med 2001;7(1):129.

Pediatric Asthma Management

In the September 2011 issue of RESPIRATORY CARE, Myers and Tomasio provide an excellent review of current asthma management and pathophysiology in their article titled "Asthma: 2015 and Beyond."[1] In the section regarding emergency department (ED) treatment the authors assert that it's widely accepted that a treatment given via small-volume nebulizer (SVN) is preferred over metered-dose inhaler (MDI) with spacer. Pediatric patients and parents overwhelmingly prefer MDI with spacer to SVN (84% for parents and 82% for patients).[2] The authors cite no references to support their claim, and MDIs have been proven to be as effective as SVN in pediatric patients. They state children can't perform an effective MDI technique, but treatments given with a spacer, valved holding chamber with mask are effective for medication delivery.[3] Given that the therapeutic benefit of an aerosol given by blow-by[4] or loose fitting mask[5] is greatly reduced or negligible, the administration method chosen should be the one the child tolerates best.[6,7] Giving treatments via MDI with spacer reinforces to the parents and patients that MDI with spacer and mask works as well as treatment via SVN.

The authors describe conflicting conclusions from a meta-analysis and Cochrane Review about the benefit of continuous albuterol therapy. Continuous albuterol has been shown to be a safe and effective treatment of asthma exacerbations and may be of benefit for patients with the most severe air-flow obstruction.[8] Heliox is an effective adjunct in severe asthma and can be initiated in the ED to reduce work of breathing, increase bronchodilator deposition, and reduce air-trapping. Heliox is not indicated for routine use in asthmatic patients but may be of benefit for severe exacerbations in the ED.[9,10] Intravenous magnesium is also an effective treatment option that can be initiated in the ED.[11] Inhaled magnesium sulfate is a potential novel treatment for severe asthma.[12] Positive-pressure ventilation can also be used to effectively treat pediatric patients in the ED and those admitted to a pediatric intensive care unit.[13,14] Respiratory therapists are crucial in the early detection and initiation of adjunctive therapy in preventing respiratory failure.

The ED can be considered a golden opportunity for asthma education. Most asthma patients who present to the ED are discharged home. An asthma attack severe enough to present to the ED means the patient has poorly controlled asthma or requires proper teaching on proper medication use and should be started on controller medication. Unfortunately, many patients have poor follow-up, due to various socioeconomic factors and ED physicians' reticence in acting as primary care in prescribing pediatric patients with controller medications.[15,16] Proper education of patients is essential to prevent their return to the ED and to prevent a potential life-threatening attack. Assuring patients have access to their medications, use proper techniques when using their MDIs, understand when to give each medication, and when to return to the ED are essential to their treatment. We should look at visits to the ED as an opportunity to educate patients by not only treating their current exacerbation but also optimizing their overall medication reg-