

題名:Hypercapnic acidosis attenuates ventilator-induced lung injury  
in rats

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摘要:We measured the effects of raising perfusate pH on ventilator-induced cell wounding and repair in ex vivo mechanically ventilated hypercapnic rat lungs. Lungs were randomized to one of three perfusate groups: 1) unbuffered hypercapnic acidosis, 2) bicarbonate-buffered hypercapnia, or 3) tris-hydroxymethyl aminomethane (THAM)-buffered hypercapnia. The membrane-impermeant label propidium iodide was added to the perfusate either during or after injurious ventilation providing a means to subsequently identify transiently wounded and permanently wounded cells in optical sections of subpleural alveoli. Normalizing perfusate pH in hypercapnic preparations attenuated ventilator-induced cell injury, particularly in THAM-buffered preparations. This was observed despite greater amounts of edema and impaired lung mechanics compared with other treatment groups. Protective effects of buffering of hypercapnic acidosis on injury and repair were subsequently confirmed in a cell scratch model. We conclude that buffering of hypercapnic acidosis attenuates plasma cell injury induced by mechanical hyperinflation.