Development and comparison of a minimallyinvasive model of autologous clot pulmonary embolism in Sprague-Dawley and Copenhagen rats

Runyon, Michael S ; Gellar, Michael A ; Sanapareddy, Nina ; Kline, Jeffrey A. ; Watts, John A

Permanent Link: http://hdl.handle.net/1805/4983

Keywords: pulmonary embolism ; rats ; pulmonary hypertension

Date: 2010-02

Cite As:

Runyon, M. S., Gellar, M. A., Sanapareddy, N., Kline, J. A., & Watts, J. A. (2010). Development and comparison of a minimally-invasive model of autologous clot pulmonary embolism in Sprague-Dawley and Copenhagen rats. Thrombosis journal, 8(1), 3.

Abstract:

Background Experimental models of pulmonary embolism (PE) that produce pulmonary hypertension (PH) employ many different methods of inducing acute pulmonary occlusion. Many of these models induce PE with intravenous injection of exogenous impervious objects that may not completely reproduce the physiological properties of autologous thromboembolism. Current literature lacks a simple, well-described rat model of autlogous PE. Objective: Test if moderate-severity autologous PE in Sprague-Dawley (SD) and Copenhagen (Cop) rats can produce persistent PH. Methods blood was withdrawn from the jugular vein, treated with thrombin-Ca++ and re-injected following pretreatment with tranexamic acid. Hemodynamic values, clot weights and biochemical measurements were performed at 1 and 5 days. Results Infusion of clot significantly increased the right ventricular peak systolic pressure to 45-55 mm Hg, followed by normalization within 24 hours in SD rats, and within 5 days in COP rats. Clot lysis was 95% (24 hours) and 97% (5 days) in SD rats and was significantly lower in COP rats (70%, 24 hours; 87% 5 days). Plasma D-dimer was elevated in surgical sham animals and was further increased 8 hours after pulmonary embolism. Neither strain showed a significant increase in

bronchoalveolar chemotactic activity, myeloperoxidase activity, leukocyte infiltration, or chemokine accumulation, indicating that there was no significant pulmonary inflammation. Conclusions Both SD and COP rats exhibited near complete fibrinolysis of autologous clot PE within 5 days. Neither strain developed persistent PH. Experimental models of PE designed to induce sustained PH and a robust inflammatory response appear to require significant, persistent pulmonary vascular occlusion.

Files in this item

Name: runyon-2010-devel ... View/Open
Size: 521.1Kb
Format: PDF

This item appears in the following Collection(s)

- Jeffrey A. Kline
- Emergency Medicine Articles