- Tabuchi A, Kuebler WM. Endothelium—platelet interactions in inflammatory lung disease. Vascul Pharmacol 2008;49:141–50.
- Krupiczojc MA, Scotton CJ, Chambers RC. Coagulation signalling following tissue injury: focus on the role of factor Xa. Int J Biochem Cell Biol 2008;40:1228–37.
- Chu AJ. Tissue factor mediates inflammation. Arch Biochem Biophys 2005;440:123–32.
- GINA. Global Strategy for Asthma Management and Prevention. Global Initiative for Asthma (GINA) 2007; Available from: http://www.ginasthma.org.
- Persson CG, Erjefalt JS, Greiff L, et al. Contribution of plasma-derived molecules to mucosal immune defence, disease and repair in the airways. Scand J Immunol 1998; 47:302–13
- Van Rensen EL, Hiemstra PS, Rabe KF, et al. Assessment of microvascular leakage via sputum induction: the role of substance P and neurokinin A in patients with asthma. Am J Respir Crit Care Med 2002;165:1275–9.
- Drake TA, Morrissey JH, Edgington TS. Selective cellular expression of tissue factor in human tissues. Implications for disorders of hemostasis and thrombosis. Am J Pathol 1989:134:1087–97.
- Moosbauer C, Morgenstern E, Cuvelier SL, et al. Eosinophils are a major intravascular location for tissue factor storage and exposure. Blood 2007:109:995–1002
- Cohen L, Tarsi J, Ramkumar T, et al. Epithelial cell proliferation contributes to airway remodeling in severe asthma. Am J Respir Crit Care Med 2007:176:138–45
- Shinagawa K, Martin JA, Ploplis V, et al. Coagulation factor Xa modulates airway remodeling in a murine model of asthma. Am J Resp Crit Care Med 2007;175:136–43.
- Pizzichini E, Pizzichini MM, Efthimiadis A, et al. Indices of airway inflammation in induced sputum: reproducibility and validity of cell and fluid-phase measurements. Am J Respir Crit Care Med 1996;154:308–17.
- Kelly MM, Leigh R, Jayaram L, et al. Eosinophilic bronchitis in asthma: a model for establishing dose-response and relative potency of inhaled corticosteroids. J Allergy Clin Immunol 2006;117:989–94.
- Guadiz G, Sporn LA, Simpson-Haidaris PJ. Thrombin cleavage-independent deposition of fibrinogen in extracellular matrices. *Blood* 1997;90:2644–53.

- Bagoly Z, Haramura G, Muszbek L. Down-regulation of activated factor XIII by polymorphonuclear granulocyte proteases within fibrin clot. *Thromb Haemost* 2007;98:359

  –67.
- Chu EK, Cheng J, Foley JS, et al. Induction of the plasminogen activator system by mechanical stimulation of human bronchial epithelial cells. Am J Respir Cell Mol Biol 2006:35:628–38.
- Katona E, Nagy B, Kappelmayer J, et al. Factor XIII in bronchoalveolar lavage fluid from children with chronic bronchoalveolar inflammation. J Thromb Haemost 2005:3:1407–13.
- Bach-Gansmo ET, Halvorsen S, Godal HC, et al. D-dimers are degraded by human neutrophil elastase. Thromb Res 1996;82:177–86.
- Irigoyen JP, Munoz-Canoves P, Montero L, et al. The plasminogen activator system: biology and regulation. Cell Mol Life Sci 1999;56:104

  –32.
- Boffa MB, Koschinsky ML. Curiouser and curiouser: recent advances in measurement of thrombin-activatable fibrinolysis inhibitor (TAFI) and in understanding its molecular genetics, gene regulation, and biological roles. Clin Biochem 2007; 40:431–42
- Xiao W, Hsu YP, Ishizaka A, et al. Sputum cathelicidin, urokinase plasminogen activation system components, and cytokines discriminate cystic fibrosis, COPD, and asthma inflammation. Chest 2005;128:2316–26.
- Kowal K, Zukowski S, Moniuszko M, et al. Plasminogen activator inhibitor-1 (PAl-1) and urokinase plasminogen activator (uPA) in sputum of allergic asthma patients. Folia Histochem Cytobiol 2008;46:193–8.
- Fujimoto H, Gabazza EC, Taguchi O, et al. Thrombin-activatable fibrinolysis inhibitor deficiency attenuates bleomycin-induced lung fibrosis. Am J Pathol 2006;168:1086– 96.
- Myohanen H, Virtanen I, Vaheri A. Elimination of hydrocortisone from the medium enables tissue plasminogen activator gene expression by normal and immortalized nonmalignant human epithelial cells. *Biol Chem* 2001;382:1563–73.
- Saksela O, Rifkin DB. Cell-associated plasminogen activation: regulation and physiological functions. *Annu Rev Cell Biol* 1988;4:93–126.
- Marshall LJ, Ramdin LS, Brooks T, et al. Plasminogen activator inhibitor-1 supports IL-8-mediated neutrophil transendothelial migration by inhibition of the constitutive shedding of endothelial IL-8/heparan sulfate/syndecan-1 complexes. J Immunol 2003;171:2057–65.

## **Lung alert**

## Treatment with low-dose lansoprazole may reduce frequency of COPD exacerbations in older patients

Colds caused by respiratory viruses can trigger exacerbations of chronic obstructive pulmonary disease (COPD). This Japanese study investigated whether lansoprazole reduces the frequency of COPD exacerbations by mitigating the effects of respiratory viruses.

One hundred and three patients with COPD (mean age 75 years, 95% male), but without evidence of gastro-oesophageal disease, were randomised to receive lansoprazole 15 mg once daily or no treatment on top of their usual COPD medications. Patients were followed for 1 year during which time they recorded a daily score for symptoms of a common cold and attended hospital fortnightly. The authors used a healthcare utilisation definition for an exacerbation of COPD.

Direct comparison of the two groups using standard parametric tests revealed no difference in the frequency of common colds between the two groups, although multivariate analysis suggested that lansoprazole use may be associated with a lower risk of frequent colds (>3/year). There was a significant reduction in COPD exacerbations in the lansoprazole group (mean 0.34 exacerbations per year in the lansoprazole group vs 1.18 in the control group).

Apart from one patient in the treatment arm who withdrew due to diarrhoea, the authors give no information on adverse events in patients treated with lansoprazole. Reduction in viral infection by treatment with lansoprazole certainly warrants further study.

► Sasaki T, Nakayama K, Yasuda H, *et al.* A randomized, single blind study of lansoprazole for the prevention of exacerbations of chronic obstructive pulmonary disease in older patients. *J Am Geriatr Soc* 2009;**57**:1453—7.

## Laura Willis

**Correspondence to:** Dr L Willis, SpR, Northwick Park Hospital, Harrow, UK; willislk@doctors.org.uk *Thorax* 2009;**64**:1043. doi:10.1136/thx.2009.127431

Thorax December 2009 Vol 64 No 12