severe hypoxaemia under hypoxic conditions? Limited data from the literature suggest that patients with very severe obstructive lung disease (forced expiratory volume in one second of <1 L [6] and/or hypercapnia [7, 8]) are at risk of severe in-flight hypoxaemia despite a good ground-level SpO₂.

Accordingly, it would also be interesting to have answers to the following questions concerning Global Initiative for Chronic Obstructive Lung Disease stage IV chronic obstructive pulmonary disease patients. 1) How many patients with a ground-level arterial oxygen saturation measured by pulse oximetry of >95% underwent hypoxic challenge testing? 2) How many patients flew without oxygen and without pre-flight hypoxic challenge testing?

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STATEMENT OF INTEREST

None declared.

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Prevention of ventilator-associated pneumonia: possible role of antimicrobials administered *via* the respiratory tract

To the Editors:

We read with interest the comprehensive and useful review of LORENTE *et al.* [1] regarding the evidence concerning measures for prevention of ventilator-associated pneumonia (VAP). The authors did not comment on the prophylactic use of antimicrobial agents administered *via* the respiratory tract as a potential preventive strategy for VAP. Relevant guidelines of the Canadian Critical Care Trials Group and the Canadian Critical Care Society [2] recommend against the prophylactic use of oral or intratracheal antibiotics for this purpose. However, a recently published meta-analysis of randomised controlled trials (RCTs) revealed that prophylactic administration of antimicrobials (aerosolised or endotracheally instilled) *via* the respiratory tract, as opposed to control treatment, was associated with a reduced incidence of pneumonia (odds ratio (OR) 0.49; 95% confidence interval (CI) 0.32–0.76) in intensive care unit patients [3]. In contrast, no difference was detected with regard to mortality between the groups compared (OR

0.86; 95% CI 0.55–1.32); the emergence of resistance associated with the implementation of this strategy was not examined due to insufficiency of the relevant available data [3].

After the publication of the aforementioned meta-analysis [3], one additional RCT on this topic has been published [4]. By comparing a prophylactic course of aerosolised ceftazidime with placebo in intubated trauma patients, the authors of the RCT reported that the number of patients with VAP was 26 (49%) out of 53 and 26 (50%) out of 52 in the prophylaxis and placebo groups, respectively [4]. We recalculated the pooled OR by adding this new information, in an attempt to update the previous meta-analysis [3]. Again, a significant difference was revealed regarding the incidence of pneumonia in favour of the prophylactic as opposed to the nonprophylactic group (OR 0.47; 95% CI 0.24–0.91).

The potential usefulness of antimicrobials administered *via* the respiratory tract for the prevention of ventilator-associated

pneumonia has been also commented upon by other experts in the field [5, 6]. Thus, the present authors believe that the prophylactic administration of antimicrobials *via* the respiratory tract for ventilator-associated pneumonia deserves the attention of investigators. However, future studies should focus not only on the effectiveness of this strategy but also on safety and the issue of emergence of antimicrobial resistance.

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STATEMENT OF INTEREST

None declared.

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Competitive swimmers with allergic asthma show a mixed type of airway inflammation

To the Editors:

Elite swimmers are at increased risk of asthma [1]. This has been attributed to airway inflammation and increased airway responsiveness induced by high-intensity long-term exercise and repeated exposure to the chlorine-rich atmosphere in swimming pools during training and competition [2, 3]. Recently, increased levels of leukotriene (LT)_{B₄} in exhaled breath condensate and normal exhaled nitric oxide fraction (FeNO) levels have been reported in five elite swimmers, suggesting possible underlying neutrophilic airway inflammation [4]. Previous analysis of induced sputum in nonasthmatic elite swimmers showed increased proportion of eosinophils and neutrophils compared with healthy controls [3].

We aimed to characterise the airway inflammation in competitive asthmatic swimmers. Athletes from the FC Porto main swimming team and 20 nonathlete asthmatics were recruited; participants gave informed consent. Subjects were classified by their asthma and training status as asthmatic swimmers (n=6, two female, aged 17±2 yrs, competing 8±3 yrs, training 16±4 h·week⁻¹), asthmatics (n=20, eight female, aged 14±3 yrs) and swimmers (n=20, six female, aged 17±2 yrs, competing 8±3 yrs, training 17±3 h·week⁻¹).

All asthmatics and nine (45%) of the swimmers were atopic according to skin-prick test results. None smoked. During two visits to the clinic, 1 week apart, subjects' sputum cell counts, FeNO, lung volumes and airway responsiveness to methacholine

(provocative dose causing a 20% fall in forced expiratory volume in one second (FEV₁); PD₂₀) were determined. Sputum cell counts were further compared with reference values from a group of healthy schoolchildren (n=15, five female, aged 9±2 yrs, 40% atopic) [5].

Sputum was examined as described previously [3]. Briefly, after induction using an inhalation of hypertonic saline, sputum was selected and treated with dithiothreitol (Sputolysin®; Calbiochem Corporation, San Diego, CA, USA). The suspension was centrifuged and the cell pellet was resuspended. Cytospins were prepared and stained using May-Grünwald/Giemsa. Differential cell counts were made by counting a minimum of 500 nonsquamous cells. FeNO was measured by chemiluminescence (NIOX; Aerocrine, Stockholm, Sweden) and PD₂₀ methacholine was determined using the dosimeter method, according to recommendations [6, 7]. ANOVA was used to detect differences between groups. Due to the skewed distribution, eosinophil counts and PD₂₀ methacholine comparisons were made after logarithmic transformation. In order to permit analysis in the log scale, a constant (0.01) was added to each value to eliminate 0 values. A p-value <0.05 was considered to be statistically significant.

Induced sputum samples of asthmatic swimmers showed increased numbers of eosinophils and neutrophils compared with both healthy subjects and asthmatic patients respectively, and lymphocytes compared with healthy subjects, although the numbers were approximately the same as in swimmers or