Diesel exhaust augments allergen-induced lower airway inflammation

While the link between allergic airway disease and traffic-related air pollution has been shown in other models, the specific effect of diesel exhaust on human lungs *in vivo* has not been demonstrated.

Based on data from *in vitro* and rodent models, a team from Canada and Sweden hypothesised that a 2-h inhalation of diesel exhaust would augment the allergic response in the lower airways in human subjects. 18 atopic subjects (allergic to birch, Pacific grasses or house dust mite) were randomised to either filtered air or diesel exhaust (300 µg of $PM_{2.5}$ per m^3) followed by diluent-controlled allergen challenge; exclusion criteria were pregnancy, corticosteroid or regular bronchodilator use, unstable asthma, vitamin supplementation, comorbid disorders or occupational exposure. 2 days after exposure, samples were taken using bronchoalveolar lavage and analysed for markers and modifiers of allergic inflammation as well as immune responses.

Diesel exhaust alone was associated with non-allergic inflammation and monocyte chemotactic protein 1 expression, and suppressed activity of macrophages and myeloid dendritic cells. The combination of diesel exhaust exposure and allergen challenge showed that the former augmented the allergen-induced increase in airway eosinophils, interleukin 5 and eosinophil cationic protein. Genotyping also showed that a null allele of the *GSTT1* gene was significantly associated with the augmented interleukin 5 response.

This is the first controlled study on human subjects to show that diesel exhaust augments the allergic reaction. Together, the data show that those with allergies are a population susceptible to the airway effects of diesel exhaust.

(*Thorax* 2015; DOI: 10.1136/thoraxjnl-2015-207399)

New antibiotic resistance risk and the continued call to use antibiotics more wisely

During routine investigation into *Escherichia coli* antibiotic resistance from food animals in China, a substantial increase in colistin resistance has been discovered.

Colistin belongs to the polymyxin family of antibiotics which are effective against Gram-negative bacteria, including those involved some types of pneumonia, and multi-drug resistant tuberculosis (MDR-TB). It is often referred to as the last line in antibiotics used to treat serious infections and those which have become resistant to other antibiotics.

Polymyxin resistance has been observed in isolated cases, involving chromosomal mutations, but what makes this discovery worrying is that this resistance is plasmid based and can be readily spread by horizontal gene transfer.

The group in China isolated an *E. coli* strain, SHP45, and identified the mcr-1 gene, which was shown to be solely responsible for the polymyxin resistance and found to be maintainable in *Klebsiella pneumoniae* and *Pseudomonas aeruginosa* strains.

Antibiotic resistance is a serious health concern, with almost half a million new cases of MDR-TB in 2013 and over 100 countries now known to have extensively drug-resistant TB. No major new types of antibiotic have been developed in the last 30 years and the World Health Organization warns that, without urgent action, we will find ourselves in a "post-antibiotic era", in which common infections will be fatal and minor injuries could lead to life-threatening conditions.

Careful antibiotic management is essential to reducing the increase of antibiotic resistance. Policy makers can reduce the need for antibiotics by increasing hygiene, sanitation, infection control measures and vaccination; patients should only use antibiotics if they have been prescribed by a health professional and should always complete their course even if they feel better; and health professionals can ensure that they do not unnecessarily prescribe antibiotics and that they select appropriate antibiotics and duration of treatment.

(*The Lancet Infectious Diseases*; DOI: 10.1016/S1473-3099(15)00424-7 and www.who.int/drugresistance/en/)

World Health Organization releases 2015 global report on tuberculosis

The latest edition of the World Health Organization's Global tuberculosis report was released on October 28. This report was the 20th instalment of the report and marks the deadline for the goals set out in the Millenium Development Goals.

Data collected from 205 countries, accounting for >99% of the world's population, show that tuberculosis mortality has fallen by 47% since 1990, with the overwhelming majority of those improvements seen since the inception of the Millennium Development Goals, with incidence falling by an average of 1.5% per year since 2000 in high-burden countries.

Globally reported totals for new cases are, paradoxically, increased; however, the report suggests that this increase is due to better national data collection rather than any increase in the spread of the disease.

However, despite major advances, tuberculosis is one of the world's biggest health threats with 1.5 million people dying in 2014 as a result of infection and 9.6 million people estimated to have contracted the infection.

HIV–tuberculosis coinfection was also highlighted in the report. All HIV-positive patients who develop tuberculosis are eligible to receive antiretroviral treatment; however, only a third of the estimated 1.2 million HIV–tuberculosis patients are treated.

Now at the end of the Millenium Development Goals, the World Health Organization move towards the Sustainable Development Goals with the End TB Strategy, aiming to see an 80% decrease in new tuberculosis cases and 90% decrease in tuberculosis deaths by 2030. This year's global report shows that much has been done and that there is still plenty to do to achieve these goals.

(www.who.int/tb/publications/global_report/en/ and www.who.int/tb/strategy/en/)

Reduced nicotine standards for cigarettes

In the USA, the Food and Drug Administration has the power to reduce the nicotine content of cigarettes; however, to date, there have been few studies to show the efficacy of limiting nicotine content of cigarettes in smoking reduction or cessation, with fears over efficacy and the potential for subjects to smoke increased numbers of cigarettes in order to compensate for the reduced nicotine intake.

In order to determine if this strategy could have beneficial outcomes, a double-blind randomised trial was conducted. 840 smokers with no intent to quit were randomly assigned to smoke either normal cigarettes (15.8 mg of nicotine per g tobacco) or cigarettes of varying nicotine content ranging from 33% to 2% (5.2, 2.4, 1.3, and 0.4 mg of nicotine per g tobacco) the nicotine content of typical commercial products.

Participants assigned to 15.8 $mg \cdot g^{-1}$ cigarettes smoked ~22 cigarettes per day, significantly more than those who smoked the lowest three strengths (15–16.5 cigarettes per day) and those who were assigned 5.2 $mg \cdot g^{-1}$ cigarettes smoked ~21 per day. Those assigned to smoke ≤5.2 $mg \cdot g^{-1}$ were more likely to report smoking at least one non-study cigarette during the 6-week study.

Smokers assigned the 0.4 $mg \cdot g^{-1}$ cigarettes were more likely to report quit attempts in the follow-up interview.

As nicotine dependence sustains tobacco use, reducing nicotine consumption can have benefit in smoking cessation. This study showed that cigarettes with lower nicotine content reduced exposure and dependence on nicotine. Furthermore, there did not appear to be evidence of compensatory smoking (determined by self-report and confirmed by expired carbon monoxide testing). These data might suggest that limiting nicotine in cigarettes may have health benefits.

(*New England Journal of Medicine*; DOI: 10.1056/NEJMsa1502403)

Respiratory matters: the experts' blog

The European Respiratory Society has launched a new blog on its website

Spearheaded by Peter Sterk, Sylvia Hartl and Thierry Troosters, the blog aims to be a focus point where professionals working in different areas of respiratory health discuss topical issues and share the latest developments in the field.

The first instalment comes from Thierry Troosters, talking about the Take the Active Option campaign, who examines why being active is important for healthcare professionals as well as patients and how we can all take the active option in our daily lives.

Check out the blog at www.ersnet.org/respiratorymatters

Two new ways for you to contribute to *Breathe*

Annual case report competition

Breathe is now available online *via* PubMed Central, making its content more visible to more readers and allowing authors' articles to be more widely discoverable. In celebration of this, we are pleased to announce a new annual competition for case report submissions.

Case reports that are suitable will be published either in print and online, or online only, and the author of the best case report each year will win a copy of their choice of an *ERS Handbook* or *ERS Monograph*.

The primary purpose of *Breathe* case reports is educational and, therefore, they should be clinically interesting and of educational value, and not represent rare or unusual situations. Cases are presented in a chronological manner, interspersed with interactive questions and explanatory answers concerning the best way to proceed given the data to that point.

Terms and Conditions: The best case report will be judged by the Chief Editor. The judge's decision is final. One copy of an *ERS Handbook* or *ERS Monograph* from available stock will be offered to the submitting author of the winning case report. All case reports should be submitted via mc.manuscriptcentral.com/edu and will be peer reviewed and published in the next available issue or online if deemed appropriate.

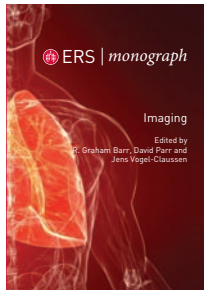
Readers' pictures

We will also be publishing readers' photographs and artwork relating to the world of lung health, disease, clinical care, management and research. These can be anything from photographs of procedures to paintings of lungs. If you think something may be of clinical interest or you want to show off your artistic talent, please feel free to send your pictures to breathe@ersj.org.uk. Please note, that due to patient confidentiality, we may choose not to publish certain images.

ERS Monograph 70: Imaging

Edited by R. Graham Barr, David Parr and Jens Vogel-Claussen

Imaging is key to the screening and diagnosis of many respiratory conditions. It is also an area of significant debate, particularly with regard to questions surrounding safety and overuse. This *Monograph* will be of interest to pulmonologists in all areas of respiratory medicine. The Guest Editors have divided the book into two areas: imaging methodology and safety; and imaging use in specific respiratory conditions. Chapters will include: safety issues in CT and MRI, MRI methods, nuclear medicine, chest radiography, COPD, cystic fibrosis, asthma, lung cancer, pulmonary hypertension, and much more.



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