

provision of affordable anti-inflammatory inhaler therapies and improved care of asthma in general. We are supportive of this categorisation of severe asthma within the WHO definition.

The ERS/ATS definition identifies the group of patients encompassed by categories 1 and 3. We see the ERS/ATS guidelines as entirely complementary to the WHO document focusing on these two categories, particularly treatment-resistant severe asthma, where approaches to phenotyping and targeted novel therapies will be needed, once the issue of untreated asthma at the individual level has been excluded.

We thank J. Bousquet and colleagues for giving us the opportunity to clarify these issues.



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The ERS/ATS guidelines define severe asthma as distinct from under-treated asthma

<http://ow.ly/zQJLI>

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Hot tub *Legionella* pneumonia outbreak

To the Editor:

We read with interest the article on legionnaires' disease in Europe by BEAUTÉ *et al.* [1]. As highlighted in that paper, larger outbreaks of legionnaires' disease tend to gain more attention although smaller outbreaks occur, which also have implications on public health.

Such an outbreak occurred in the Stoke-on-Trent area of North Staffordshire, UK, in July 2012, the first case presenting on July 18, 2012 with symptoms of a pneumonic illness. A positive urine *Legionella* antigen test was reported 5 days later (*Legionella pneumophila* serogroup 1). A number of similar presentations were admitted in the days that followed and 13 cases of *Legionella* pneumonia were confirmed by July 23, at which stage it was evident an outbreak was emerging. By the end of the outbreak at the beginning of August, a total of 20 cases had been confirmed.

The reported cases were all from the local area of Stoke; 13 were male. Age ranged from 48 to 79 years (mean 65 years). 50% were ex-smokers. Three patients were immunosuppressed by long-term oral steroid use (for Crohn's disease, polymyalgia rheumatica and gall bladder malignancy). One patient reported foreign travel in the month preceding the outbreak (Mallorca, Spain). The clinical features observed in the group were consistent with those reported for *Legionella* pneumonia. 14 patients had a documented fever >38°C on admission. There was evidence of a marked inflammatory response in all cases, with notably raised C-reactive protein (range 152–869 mg·L⁻¹, mean 308 mg·L⁻¹; reference range 0–5 mg·L⁻¹). Deranged liver enzymes were seen in 80% with associated hypoalbuminaemia (range 18–33 g·L⁻¹; reference range 35–50 g·L⁻¹). 10 patients had a serum albumin concentrations <25 g·L⁻¹. Hyponatraemia, however, was not observed to be a prominent biochemical abnormality.

All but one of the patients had evidence of consolidation on chest radiography. CURB-65 (confusion, urea >7 mmol·L⁻¹, respiratory rate ≥30 breaths·min⁻¹, blood pressure <90 mmHg (systolic), ≤60 mmHg

(diastolic), age ≥ 65 years) severity score was documented in 13 cases; three patients scored 1, eight scored 2 and two scored 3. The first six confirmed cases all had scores of either 1 or 2. Length of hospital stay ranged from 3 to 28 days (mean 8 days), and patients were managed mainly on the respiratory and infectious diseases wards. Six patients were admitted to critical care for respiratory support, where two required invasive ventilation. One was severely compromised and thought to need extracorporeal membrane oxygenation. He was transferred to the nearest centre but subsequently improved with conventional ventilation. 18 patients were discharged from hospital; two died: one on critical care with severe multiorgan failure, the other on the ward who was deemed unsuitable for critical care management due to various comorbidities. One patient was re-admitted 2 days following discharge with chest pain, for which no serious cause was found.

A positive urine *Legionella* antigen test was confirmed in all 20 cases. Sputum samples for PCR analysis were obtained from 11 patients; eight were positive for *L. pneumophila*. Further direct DNA sequence-based typing identified the same strain in all eight samples. In six of those, *Legionella* cultures were positive and the strain was confirmed as *L. pneumophila* serogroup 1, monoclonal antibody subgroup "Benidorm" ST1268, a previously unrecognised strain. Reasons why no more sputum samples were not obtained are not entirely clear but we suspect it was due to practicalities of sample collection. Nonetheless, the samples obtained were sufficient to allow further investigation of the outbreak.

The public health enquiry undertaken by the UK Health Protection Agency eventually identified three different local retail sites in the southern area of Stoke-on-Trent that the affected patients had visited: a supermarket (nine cases); a discount warehouse (20 cases); and a home improvement store (13 cases). Inspection of the supermarket detected no liable sources. A number of indoor fountains were found at the home improvements store but they all tested negative on sampling. It was the discount warehouse that became of particular interest. Well known to the local population, this was a large store that sold a variety of items at discounted prices. It was at this site that a hot tub on open display was located. A swab taken from the tub identified the same *L. pneumophila* strain as in the sputum of the confirmed cases. All 20 patients, in fact, confirmed visiting the store at some point within the 2 weeks prior to the onset of their acute illnesses. Other sites tested as part of the investigation included the local cooling towers. One tower did test positive but this was a different strain and thought unlikely to be related to this outbreak. All other investigated sites were negative. It was, therefore, concluded that the display hot tub at the discount store was the most likely source of the outbreak.

Although on a smaller scale in comparison to some other reported outbreaks of legionnaires' disease, our local incident highlights the importance of clinicians' awareness of *Legionella* pneumonia as a potential cause in any case of severe community-acquired pneumonia. The British Thoracic Society recommends routine testing for *Legionella* pneumonia in patients with severe community-acquired pneumonia based on the CURB-65 score (*i.e.* score ≥ 3) or in those with moderate disease severity in the presence of risk factors such as travel or occupation [2]. Pertinent to this outbreak is that most of the cases, particularly the first few, did not actually qualify for routine testing based on their severity score and had no relevant travel history or occupational exposure; only one patient reported a recent travel history. It is, therefore, a reminder that a travel history is not always present and a high index of clinical suspicion is required to initiate the appropriate investigations.

The importance of identifying *Legionella* pneumonia promptly is illustrated by this outbreak, which had the potential to develop into an outbreak on a much larger scale when the culprit source is taken into consideration. The hot tub was in fact positioned at the front of the store close to the tills and exits, meaning that a large number of people would have come into contact with it. It was only through vigilant, timely investigation and management that the number of persons affected by this incident were prevented from increasing. Spa pools have been linked to a number of outbreaks of legionnaires' disease, both when in use and on display. This is yet another incident that reiterates the need for their safe management to reduce and prevent infection.



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The importance of identifying *Legionella* pneumonia promptly is illustrated by an outbreak in the UK <http://ow.ly/zV9fn>

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