

**Can we readily identify
patients who need antibiotics
in a severe influenza
pandemic?**

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TO THE EDITOR: The current pandemic influenza A (H1N1) strain first caused infections in Mexico in April 2009 and rapidly spread to over 160 countries. Confirmed laboratory infections now number over 160 000, with millions of people probably already infected and further spread inevitable.¹

Fears have been expressed that the enormous death toll seen with the H1N1 “Spanish ‘flu” pandemic of 1918–1919 might be

repeated. Although many deaths during that pandemic were caused by the direct effects of the influenza virus, over 95% of deaths were due to secondary bacterial pneumonias.^{2,3} If, as in 1918, most people with the current H1N1 strain have a mild illness from which they fully recover, this raises the important question of how we can readily identify patients co-infected with bacterial pathogens who may need antibiotic treatment for pneumonia. This is important in a situation where large numbers of people may need to be assessed, and demand for both antiviral and antibacterial agents may be high. Certain clinical features, such as the presence of a biphasic illness or the late development of purulent sputum, may suggest bacterial infection, but we do not know how reliable these features will be.⁴

The Australian Community-Acquired Pneumonia (CAP) Study was the largest ever prospective aetiological study of CAP.⁵ All patients were assessed for both bacterial and viral pathogens, including seasonal influenza.⁵ Using data from that study, easily measured clinical markers in patients

infected with both influenza virus and a bacterium were compared with markers in patients with only an influenza virus identified. Patients with both influenza virus and a bacterial pathogen tended to be younger and appeared to have poorer outcomes.⁶ The most notable clinical differences between the two groups at presentation were the higher mean respiratory rate and faster heart rate in those with influenza virus plus a bacterial pathogen (Box). However, there were major overlaps between the groups in these parameters, so they were not very discriminatory if used alone.

Taken with other clinical features,⁴ our data suggest that the presence of a respiratory rate of ≥ 25 breaths/min and a heart rate of ≥ 100 beats/min may help identify people who are more likely to need prompt clinical assessment and a chest x-ray. While these features may help identify patients more likely to benefit from antibacterial therapy, we would also argue that the small proportion of patients whose influenza is serious enough for them to be admitted to hospital should probably be treated with empirical antibiotics as well as antivirals.

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Patients with influenza plus a bacterial pathogen compared with patients with influenza alone or a bacterial pathogen alone

	Influenza plus bacterial pathogen (n = 17)	Influenza alone (n = 51)	P	Bacterial pathogen without influenza (n = 293)
Mean age (years) (SD)	55.2 (26.1)	66.7 (20.0)	0.046	62.9 (20.9)
Male sex (%)	52.9%	54.9%	0.89	62.1%
Mean RR (breaths/min) (range)	28.6 (16–48)	24.6 (16–48)	0.14	24.9 (12–60)
Age-adjusted tachypnoea (%)*	47.1%	25.5%	0.10	28.0%
Mean systolic BP (mmHg) (range)	137.4 (107–215)	137.1 (65–196)	0.97	128.3 (60–215)
Mean diastolic BP (mmHg) (range)	68.2 (45–116)	69.5 (25–103)	0.81	67.1 (29–116)
Mean temperature (°C) (range)	37.8 (36.2–40.6)	37.8 (35.5–39.6)	1.0	37.9 (33.5–40.8)
Mean pulse rate (beats/min) (range)	113.4 (75–145)	96.3 (56–152)	0.01	104.5 (43–175)
Mean SpO ₂ (range)	92.4 (81–99)	91.8 (44–100)	0.79	92.6 (50–100)
Mean SMART-COP score [†] (range)	2.7 (0–7)	2.2 (0–9)	0.49	2.5 (0–9)
Need for intensive care (%) [‡]	29.4%	13.7%	0.14	13.0%
30-day mortality (%)	5.9%	0	0.08	6.5%

BP = blood pressure. RR = respiratory rate. SpO₂ = oxygen saturation (as measured by pulse oximetry).

* Age-adjusted tachypnoea was defined as RR ≥ 25 breaths/min in patients aged ≤ 50 years or RR ≥ 30 breaths/min in patients aged > 50 years.⁶ [†] A tool for determining severity of community-acquired pneumonia (for details, see Charles et al⁶). [‡] All patients required either mechanical ventilation or vasopressor support. ◆