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EDITORIAL

Winter forecasting of COPD exacerbations

See linked article by Halpin *et al.* on pg 324

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Exacerbations of chronic obstructive pulmonary disease (COPD) have a major impact on health status, disease progression and mortality.[1-3] Exacerbations show marked seasonality, and around two-thirds of all exacerbations occur in the winter months.[4] The most important triggers of COPD exacerbations are respiratory viruses – especially human rhinovirus (the common cold virus)[5,6] and other viruses such as influenza and respiratory syncytial virus (RSV) – that are commoner in winter, and this may explain why exacerbations are more likely in winter months. Exacerbations are associated with cold temperatures[7] when rhinovirus may be more widespread, and patients with a history of frequent exacerbations are more likely to acquire a common cold.[8]

Recently there has been much interest in earlier recognition and prompt therapy of COPD exacerbations, and evidence is available that earlier intervention leads to faster recovery, reduction in severity, and less chance of hospital admission.[9] As exacerbations are commoner in winter, one of the approaches is to attempt to forecast an exacerbation based on temperature changes and viral prevalence. The UK Met Office has developed a unique health forecasting service that consists of an initial educational package and then weekly automated calls that evaluate the risk of an exacerbation in the following two weeks. The objective is to improve patient recognition of an exacerbation leading to earlier intervention and thus reducing the severity of the event.

In this issue of the *PCRJ*, Halpin and colleagues[10] describe the first evaluation of this health forecasting service in COPD patients in a primary care setting. What is interesting is the actual low take-up of a novel intervention in the community; out of 679 patients on the practice register, only 240 patients expressed an interest in participating and of these only 79 were eventually randomised into either the forecasting arm or usual care. After patients in both groups were sent an education and information package, they were randomised in a single-blind manner and monitored over a 4-month period during the winter. The primary outcomes were exacerbation frequency and also the number of patients who had one or more exacerbations during the study period using a symptomatic definition. However, patients also completed a new exacerbation symptom diary – the EXACT-PRO questionnaire[11] – through a Blackberry mobile phone to act as a "flag" for the onset of an exacerbation and allow a visit by a nurse for sampling for respiratory viruses. A total of four calls were made to the patients in the active intervention arm during the trial and 78% of the patients were contacted.

The main results show that there was no difference in exacerbation frequency between the two randomised groups. Indeed, the number of exacerbations during the study period was low, partly due to the short study period but also because higher risk patients who are more likely to be admitted to hospital were not specifically targeted in this study. It is also possible that the use of the earlier exacerbation warning with the flag reduced the size of any effect from the health forecasting even though the nurses were blind to the intervention. Using the symptomatic definition there was no difference in the number of patients having one or more exacerbations, while with the EXACT-PRO questionnaire there were less patients with one or more exacerbation in the active group. However, there was no difference in exacerbation severity observed on the EXACT-PRO scoring system – as may be expected if the forecasting led to prompt therapy and earlier recovery. The authors report that 62% of exacerbations were forecast in the 14 days after the telephone call, though the crucial question is whether virus-associated exacerbations were more likely to be forecasted and detected since the intervention is specifically targeted at this exacerbation phenotype. Although it is stated that nasal samples were taken, no virus isolation results are available in this paper. This is an important question

that should be addressed before larger trials are performed. A reassuring aspect of this study is that more exacerbations were not reported by the active intervention group who were made aware if there was a potential exacerbation trigger and risk.

There were differences in exacerbation frequency between the symptomatic definition and EXACT-PRO detection. As patients were contacted when they triggered the flag on the mobile phone, one must assume that the symptomatic report was an accurate patient exacerbation frequency. A recent study shows that patients' recall of exacerbations is accurate.[12] The EXACT-PRO reports an exacerbation when at least a 12-point change in score is observed, but this will depend on the level of the baseline score and its accuracy. A major advantage of the EXACT-PRO instrument is that it has been designed to measure exacerbation severity; it is currently being evaluated for this purpose in controlled trials of COPD interventions.

The health forecasting acted as a prompt for the patient to watch out for any deterioration in their lung health.[10] However, it is not clear if regular calls to patients to remind them of the need to report exacerbations would not have had the same outcome. The control group had no regular telephone contact except the Blackberry flag. Any future trial designed to evaluate seasonal forecasting should have regular patient calls as the comparator, as a number of COPD community services are contacting their higher risk patients on a regular basis. Although a large proportion of exacerbations occur in winter, virus-associated exacerbations also occur in the summer months[4] when falls in ambient temperature are smaller, and it is not clear what role health forecasting has during this period.

This interesting pilot trial and further work on the proof of mechanism of winter health forecasting should now form the basis for a larger well-designed randomised controlled trial of health forecasting in COPD. Preferably, this should be performed in the group of patients at high risk of exacerbations, rather than in an unselected group of COPD patients as in the study by Halpin and colleagues.[10] The control intervention will need some form of regular patient contact (as is now becoming standard in the management of higher risk COPD patients). The duration of the intervention will need to be addressed and any cost benefit carefully evaluated. Current interventions aimed at reducing exacerbation frequency are not completely effective and typically reduce exacerbations by up to only 25%.[13,14] Thus, fresh approaches need to be developed, and targeting the diagnosis and prompt therapy of an acute exacerbation is a very worthwhile target in the management of patients with disabling COPD.

Conflicts of interest

None.

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