The use of mucoactive drugs for critically ill patients with acute respiratory failure in intensive care

Many patients in intensive care (ICU) need help to breathe from a machine (ventilator). However one problem that can occur as a result, is difficulty clearing secretions (mucus) from the lungs. These secretions can make breathing harder if they become thick and dry. The breathing tube from the ventilator can make coughing up secretions more difficult. Patients may also feel too sleepy from their medication to cough by themselves. This may result in developing a lung infection called ventilator-associated pneumonia. To reduce thick secretions, air coming from the ventilator can have moisture added to it (humidification). Other treatments include suctioning to remove secretions via the breathing tube. Physiotherapists may also use techniques to help clear thick secretions. In some cases medications called mucoactive drugs may be prescribed. Two common mucoactive drugs used in ICUs in the UK are ‘hypertonic saline’ and ‘carbocisteine’. We surveyed UK ICUs and found that about one-third of patients on a ventilator will be receiving a mucoactive drug. However, we do not know how well these drugs work.

In our trial we want to find out if using one, or both, of these drugs helps clear thick secretions, and if as a result, patients spend less time on the ventilator. We also want to know how safe they are, and if they improve other important outcomes.

Our trial will include 2148 patients from 40 UK ICUs, who are on a ventilator for at least 2 days, and who have thick secretions. Patients will be allocated to one of four groups, decided at random by a computer. Group 1 will receive usual care only (all normal treatments for clearing thick secretions, but no mucoactive drug); Group 2 will additionally receive hypertonic saline; Group 3 will additionally receive carbocisteine; Group 4 will additionally receive both drugs. We will compare how much time patients spend on the ventilator between each group. We will see if there was a difference in patients being taken off the ventilator (extubation), needing the breathing tube put back in (reintubation), and how long they stayed in ICU. Patients will be followed up for 6 months afterwards to compare differences in the after-effects of being ill in ICU. We will record how long patients spent in hospital, and ask them to complete a brief questionnaire to tell us how they feel about their quality of life. We will record whether any patients died. We will also be looking at value for money. Mucoactive drugs are generally not expensive. However, if they are prescribed unnecessarily and to many patients, this could be very costly overall for the NHS. At the end of the trial, we will share our findings with other ICUs, clinicians, researchers, and patient groups, to help improve patient care.
We have a large, experienced team guiding this study. They include physiotherapists, doctors, nurses, pharmacists, health economists, statisticians, former patients, and others with expertise in the study methods. Together they will ensure that the trial runs smoothly, safely, and finishes on time.

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