A randomised controlled trial and cost-effectiveness analysis of high-frequency oscillatory ventilation against conventional artificial ventilation for adults with acute respiratory distress syndrome. The OSCAR (OSCillation in ARDS) study

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Plain English summary

The OSCAR (OSCillation in ARDS) study
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Plain English summary

The acute respiratory distress syndrome (ARDS) is a term covering most acute, severe, lung conditions that cause a reduction in the blood oxygen level. Most patients with ARDS need a period of treatment on an artificial ventilator (breathing machine) if they are to survive.

While initially life-saving, artificial ventilation using standard ventilator settings can further injure the patient’s lungs and perpetuate, rather than cure, the lung inflammation that is the hallmark of ARDS. It is believed that 1 in 12 ventilated patients with ARDS may die as a result of the effects of artificial ventilation rather than the ARDS itself.

High-frequency oscillatory ventilation (HFOV) is a form of artificial ventilation where very small breaths are given very frequently (up to 10 times a second) while the patients’ lungs are kept in a partly inflated state. This is believed to reduce the mechanical trauma to the lungs that causes the continued inflammation. The OSCAR (OSCillation in ARDS) study was set up to see if HFOV improved survival in patients with ARDS.

A total of 795 patients were randomised to either HFOV or conventional artificial ventilation. One hundred and sixty-six of 398 patients (41.7%) in the HFOV group and 163 of 397 patients (41.1%) in the conventional ventilation group died within 30 days. HFOV did not reduce the hospital stay of the survivors, but did increase the use of sedative and muscle-relaxant drugs during artificial ventilation.

The cost to the NHS of treating patients with ARDS for the time in hospital and the first year after their illness was higher in the HFOV patients, at £44,550, compared with £40,129 in those patients on conventional ventilation. Adding in the cost of patient and carers’ expenses and the loss of earnings, the total cost to society was £50,583 in the HFOV group compared with £45,568 in the conventional ventilation patients.

In the first year after their illness, patients reported their quality of life at 30% of maximum in the HFOV group, compared with 25% in the conventional ventilation group. The computed cost to society of giving one patient a year of full-quality life was £88,790. Treatments at this price are not usually considered cost-effective.

In conclusion, we were unable to find any benefit or harm to the patients from the use of HFOV in adult patients with ARDS. We suggest that this mode of ventilation not be used for routine care.

At the same time as this study was reported in the medical literature, a Canadian research team published the OSCILLATE study of HFOV [Ferguson ND, Cook DJ, Guyatt GH, Mehta S, Hand L, Austin P, et al. High-frequency oscillation in early acute respiratory distress syndrome. N Engl J Med 2013;368(9):795–805] which demonstrated an increased number of deaths in the HFOV group (47% vs. 35% in the control group). Overall we believe there may be better techniques to prevent lung damage during in patients with ARDS and suggest research funding is directed at these rather than at continued studies of HFOV.
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