The NOTACS Trial: Nasal High-flow Oxygen Therapy After Cardiac Surgery

Background and Aim

After heart surgery, some patients may be at high risk of developing complications, which can lead to a longer hospital stay. People with breathing difficulties (e.g. those with lung disease, asthma, obesity or heavy smokers) are especially vulnerable. High-flow nasal oxygen therapy (HFNOT) delivers warm, humidified oxygen at high flow rates and is thought to improve breathing and comfort compared to standard oxygen therapy (SOT). The NOTACS study aimed to evaluate whether HFNOT can have a positive effect on a patient's recovery and help them to get back to normal activities more quickly than patients treated with SOT.

What Was Studied?

Researchers wanted to know if giving HFNOT immediately after removing the breathing tube (extubation) in patients at higher risk of lung problems would improve recovery compared with SOT. The main measure was "days alive and at home without extra support" in the first 90 days after surgery (DAH90) - a patient-centred outcome that reflects real-life recovery.

How Was the Study Done?

NOTACS was a large, international trial involving 1,280 adults across 17 hospitals in the UK, Australia, and New Zealand. All patients had heart surgery and at least one risk factor for breathing complications (such as lung disease, asthma, obesity, recent chest infection, or heavy smoking). Patients were randomly assigned to receive either HFNOT or SOT for at least 16 hours after surgery. Researchers monitored recovery, complications and quality of life via questionnaires both during the inpatient stay and after discharge over the phone with patients at 30 days and 90 days after surgery.

Results

The findings were clear: **HFNOT did not improve recovery compared with SOT.**

- Both groups had the same number of days at home without extra help. In fact, most patients in both groups needed some help after their surgery. This means the type of oxygen they received didn't make a difference.

- When looking at time spent at home (and ignoring whether patients needed help), both groups did equally well. On average, patients in both groups spent about 82 out of 90 days at home in the 90 days after surgery.
- Rates of complications, hospital readmissions, and quality of life were similar between groups.

What Does This Mean?

For patients at higher risk of breathing problems after heart surgery, using HFNOT routinely does not improve outcomes. Standard oxygen therapy works just as well. These results provide strong evidence that hospitals should reconsider routine use of HFNOT in this patient population.

Why Is This Important?

As HFNOT requires specialized equipment and training, determining the potential for saving other resources is also important to establish. The NOTACS trial is the largest study of its kind and offers high-quality evidence to guide practice worldwide.