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Ultraviolet air sterilizer reduces sepsis and mortality in cardiac surgery patients

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An ultraviolet air steriliser reduces sepsis and mortality in cardiac surgery patients, according to research presented today at Acute Cardiovascular Care 2016.

"Hospital-acquired infections are the most common postoperative complication in the intensive care unit (ICU) and are associated with longer hospital stay, higher mortality rates, and increased healthcare costs," said lead author Dr Juan Bustamante Munguira, a physician at the University Hospital La Princesa in Madrid, Spain.

He continued: "Pathogens are transmitted through the air, and by touching skin, clothes, and medical instruments and devices. Several studies have shown that standard cleaning methods are not effective for killing pathogens. Novel disinfection technologies, such as hydrogen peroxide vapour, ozone mists, or ultra microfibre cloths, have emerged to solve this situation."

This prospective, randomised and non-interventional clinical trial evaluated the impact of an ultraviolet air steriliser on clinical outcomes of patients in ICU who had undergone cardiac surgery. The study included 1097 patients, who were randomised to an ICU with (522 patients) or without (575 patients) the steriliser.

Patients were 68 years of age on average and 67% were men. EuroSCORE2 before surgery was similar between groups (6.90 in patients with the steriliser and 7.02 in those without), which indicates

that they had the same risk of dying during or shortly after heart surgery.

The investigators found that sepsis occurred in 3.4% of patients using the steriliser compared to 6.7% patients not using the steriliser ($p = 0.02$). The 30 day in-hospital mortality rate was significantly lower in patients using the ultraviolet air steriliser (3.8%) compared to the group without it (6.4%).

Dr Bustamante Munguira said: "Sepsis, also called blood poisoning, can be caused by an infection and is potentially life-threatening. We found lower rates of sepsis and mortality in patients who recovered from cardiac surgery in an ICU fitted with an ultraviolet air steriliser."

The incidence of ventilator-associated pneumonia was lower in the ultraviolet group but the difference between groups was not statistically significant. The length of stay in ICU and the hospital was similar in both groups.

A logistic regression model showed that age, emergency (unscheduled) surgery, and the absence of the ultraviolet air steriliser were each independently associated with 30 day in-hospital mortality.

Dr Bustamante Munguira said: "Our research shows that the ultraviolet air steriliser was independently associated with lower 30 day in-hospital mortality. The ultraviolet radiation is harmless to humans but kills microorganisms including bacteria, viruses and spores by inactivating their RNA or DNA."

He concluded: "Our research indicates that this technology may help reduce hospital infections and deaths, and larger studies may find a statistically significant benefit on pneumonia. This is a relatively new area of research and a cost effectiveness study in more patients is needed."

More information: Dr Bustamante Munguira will present the abstract 'An ultraviolet air sterilizer, can it be reduced the rate of infections in patients underwent to cardiac surgery?' during Poster Session 4: Cardiac surgery on 16 October at 14:00 to 17:30 in the Poster Area

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