ICU
MANAGEMENT & PRACTICE

In-line Filtration Reduces Organ Dysfunction, Inflammation

Patients admitted to the intensive care unit are administered drugs, fluid, and blood products intravenously. In the vast majority of these patients, there are no untoward effects of the intravenous infusion. However, young children and neonates who are ill are usually administered intravenous infusions with the use of in-line filters. The philosophy behind this approach is that the filters may not only block/filter plastic, rubber, air, fat emboli, and glass particles but also bind to toxic substances and prevent their entry into the circulation. The potential advantage of in-line filters is to prevent bloodstream infections and embolic phenomenon.

A large amount of literature exists on the benefits of in-line filters during intravenous infusion in neonates and children. While some studies have shown a decrease in complications when used in children, there are also studies that have found no benefit. Further, autopsy studies in patients with acute respiratory distress syndrome have noted that following infusion therapy, a number of patients had particulate induced mechanical vascular occlusion and formation of foreign bodies that incited inflammation.

The use of in-line filters during intravenous administration in adults is not common. There are no large studies that have looked at the benefits in adults. Adult patients admitted to the intensive care unit are often critically ill and despite optimal therapy, the outcomes are poor. Hence, there are some who suspect that perhaps external toxins enter the systemic circulation and the use of in-line intravenous filters may be of benefit.

In this single-center retrospective cohort study, researchers evaluated the effect of in-line filtration of intravenous fluids with filters (0.2/1.2 micron versus 5.0 microns). They selected 3012 patients and assigned them to either a fine filter cohort (0.2/1.2 µm, n= 1506) or a control filter (5.0 µm filters, n= 1506). The two cohorts were compared in terms of organ dysfunction (kidney, lung brain), severe vasoplegia, in-hospital complications (MI, pneumonia, ischaemic stroke, sepsis), inflammation, length of ICU stay, in-hospital mortality and overall length of stay in the hospital.

The results showed when the fine in-line filter was compared to the control filter cohort, there was no difference in any clinical parameter including mortality. In general, the use of finer 0.2/1.2 um in-line filter was associated with slightly less organ dysfunction and inflammation in critically ill adult patients, but this was not significant and did not alter the morbidity or mortality between the two groups of patients.

Overall, findings suggest that in-line filtration with finer 0.2 and 1.2 µm filters could reduce systemic inflammation and maybe morbidity in critically ill adult patients as well as improve the safety of intensive care therapy, but there is a need for further research and evidence.

Source: Critical Care
Image Credit: iStock

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