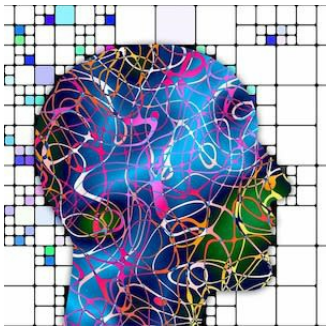
ICU
MANAGEMENT & PRACTICE

Study: ICU delirium a distinct indicator of acute brain injury



More than half of ICU patients in a newly published study experienced delirium for long periods during their stay. Sedative-associated delirium was most common, while longer periods of hypoxic delirium and unclassified delirium were associated with worse cognitive function at follow-up one year after hospital discharge.

The researchers write that their findings show that delirium, which is both common and modifiable, has far-reaching clinical relevance, as defined by association with the patient-centred outcome of long-term cognitive impairment. They note that while many sedatives have short half-lives in healthy people, the clearances of these drugs are altered in critically ill patients and can be dramatically delayed after prolonged use. The study, from the University of Pittsburgh and Vanderbilt University, is published in *Lancet Respiratory Medicine*.

The patients included in the study were from the Bringing to Light the Risk Factors and Incidence of Neuropsychological Dysfunction in ICU Survivors (BRAIN-ICU) study, and the Delirium and Dementia in Veterans Surviving ICU Care (MIND-ICU) study. Patients were assessed for delirium while in the ICU twice a day using the Confusion-Assessment Method-ICU (CAM-ICU) and the Richmond Agitation-Sedation Scale (RASS) and once a day outside the ICU. The delirium phenotypes were classified according to the presence of hypoxia, sepsis, sedative exposure, or metabolic (eg, renal or hepatic) dysfunction, which were not mutually exclusive.

Results

A total of 1040 patients with respiratory failure or septic or cardiogenic shock were included in the analysis. Seventy-one percent of participants experienced delirium at least once during their stay, and delirium occurred on 31% of all 13434 participant days. In the 4187 days of delirium, one delirium phenotype was present during 1355 days (32%), two phenotypes present during 1213 days (29%), three during 1231 days (29%), and four were present during 388 days (9%). More than half of participants who experienced delirium had hypoxic, septic, or sedative-associated delirium at some time during the study; metabolic and unclassified delirium occurred less often.

Researchers assessed 564 (80%) patients at a three-month follow-up, and 471 (75%) at a one-year follow-up using the Repeatable Battery for the Assessment of Neuropsychological Status (RBANS) and Mini-Mental State Examination (MMSE) to assess global cognition and the Trail Making Test, Part B (Trails B), to assess executive function. The study found duration of delirium to be a key indicator of cognitive decline, with longer periods of multiple delirium subcategories predicting worse cognitive decline after one year following hospital discharge. Out of the four phenotypes, metabolic delirium was the only one that didn't affect long-term cognitive decline, after adjusting for age, severity of illness, doses of sedating medications and other factors. No delirium phenotypes was associated with long-term cognitive impairment that was driven by an association with deficits in only one cognitive domain. Sub-analyses of the sedation-associated delirium (benzodiazepine-, propofol- and and opioid-associated) results showed that no specific subtype of sedative-associated delirium stood out as the main driver to explain the results of the strong association between sedative-associated delirium (as a broader phenotype) and severity of long-term cognitive impairment. However, patients were exposed to multiple sedating drugs. None of the delirium phenotypes were associated with long-term mortality.

Lead author Timothy Girard, MD, MSCI (*pictured)*, associate professor of critical care medicine, Pitt School of Medicine, said in an email to *ICU Management & Practice*: “Based on this study, intensivists should monitor ICU patients for delirium and view delirium in the setting of sedation, hypoxia, and/or sepsis as red flags indicating high risk for long-term cognitive impairment. When treating a patient with sedative-associated, hypoxic, or septic delirium, they should work to identify and reduce potential risk factors, especially those that are iatrogenic and modifiable, e.g., sedation."

Dr. Girard added that future studies on delirium prevention should focus on risk factors that predispose ICU patients to sedative-associated, hypoxic, or septic delirium and evaluate the effects of interventions not only on delirium but also on long-term cognition and associated long-term outcomes." He advised that when patients are discharged after a critical illness, those who experienced prolonged periods of sedative-associated, hypoxic, or septic delirium should be scheduled for follow-up in an ICU follow-up clinic or other setting that will facilitate assessment for cognitive impairment.

Source: UPMC; Lancet Respir Med

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