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Delirium in the ICU

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ABSTRACT

Introduction: Delirium, the most prevalent form of acute brain dysfunction in the Intensive Care Unit (ICU) is characterized by inattention, changes in cognition and at times thought and perceptual disturbances (e.g., delusions and hallucinations). Recent estimates of delirium prevalence suggest around 70% of patients on mechanical ventilation will experience delirium during their critical illness and almost a third of days in the ICU are days spent with delirium[1,2]. There are at least three distinct motor subtypes of delirium: hypoactive (decreased movement), hyperactive (increased movement and at times agitation) and mixed (features of both). The hypoactive form predominates, is under-diagnosed and is associated with worse outcomes. Recent work has suggested that another psychomotor disturbance, catatonia may co-occur in up to a third of patients with delirium in the ICU[3].
Risk factors: Risk factors for the development of delirium include: pre-existing dementia, advanced age, hypertension, pre-critical illness emergency surgery or trauma, increased severity of illness, mechanical ventilation, metabolic acidosis, prior delirium or coma and use of certain delirium potentiating drugs such as anti-cholinergic and sedative hypnotic medications.
Mechanisms: Exact mechanisms leading to the development of delirium are unknown, however early evidence suggests neural

disconnectivity of the dorsolateral prefrontal cortex and the posterior cingulate cortex. Reversible reduction of functional connectivity of subcortical regions and neuroinflammation leading to hippocampal and extra-hippocampal dysfunction, may play potential roles. Overall all brain volume loss and disruption in white matter tracts may be associated with new onset dementia in survivors of critical illness. Due to the heterogeneous phenotype of delirium, there may be multiple causative neurobiological mechanisms contributing to its development, instead of one unifying pathway.

Morbidity and mortality: Delirium is associated with significant morbidity and mortality. Much of the critical care literature about delirium has focused on the exposure of delirium and its relationship with acquired disabilities, as well as its effect on in-hospital and post-discharge excess mortality. Delirium is known to be predictive of new-onset dementia[4], depression, excess mortality, longer lengths of stay, institutionalization at discharge, inability to return to work and increased cost of care in the hospital.

Prevention and treatment: Despite scant evidence, antipsychotic medications have historically been the treatment of choice for delirium, however recent findings suggest that typical and atypical antipsychotics have no effect on delirium duration in the ICU[5]. As delirium is characterized by alterations in the sleep wake cycle, some studies have explored the role of melatonin or ramelton in the prevention or treatment of delirium, with early promising results. Non-pharmacological interventions such as complete adherence to the ABCDEF (*A*ssess, prevent, and manage pain; *B*oth spontaneous awakening and breathing trials: *C*hoice of analgesia and sedation; *D*elirium assess, prevent, and manage; *E*arly mobility and exercise; *F*amily engagement/empowerment) bundle have shown benefit in reducing delirium prevalence in the ICU[2].

Keywords: delirium, mortality, dementia, cognitive impairment, depression, PTSD, long-term outcomes

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