

Commentary

Delirium in critically ill patients

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Abstract

Delirium in the intensive care unit is a serious problem that has recently attracted much attention. User-friendly and reliable tools, such as the Confusion Assessment Method for the Intensive Care Unit (CAM-ICU), offer the clinician the opportunity to identify delirium in patients better. Diagnosis of delirium in a critical care population is often a difficult task because classical psychiatric evaluation is impossible for a number of reasons. The CAM-ICU makes use of nonverbal assessments to evaluate the cardinal features of delirium (i.e. acute or fluctuating onset, inattention, disorganized thinking and altered level of consciousness). Its development for use in the critical care setting represents a significant advance that could lead to better care for such patients.

Keywords artificial, delirium, intensive care unit, respiration

Diagnosis of delirious patients in a critical setting is a difficult task that is fraught with pitfalls. Any effort to address this issue deserves mention, and that of Ely *et al.* [1] is certainly no exception to this. Delirium in the ICU, an entity that is associated with increased mortality, morbidity and duration of stay [2–4], has recently attracted significant attention. The misnomer 'ICU psychosis' has been abandoned and efforts made to improve screening and diagnosis of delirium. These are not straightforward tasks because it is clear that the differential diagnosis of delirium is quite extensive [5], and classical psychiatric evaluation is often impractical because of the unique setting of the ICU and the clinical presentations of critical care patients.

Efforts have thus been directed toward systematic screening for delirious patients in the ICU [6]. Innovative ways to assess cognition in patients who are unable to speak have been developed [7]. However, assessment of delirium in a more restricted group of ICU patients, such as those who are mechanically ventilated, has not been evaluated until recently [1]. Is it possible for the busy critical care nurse and physician to have at their disposal a user-friendly, rapid and reliable tool that allows them to diagnose delirium in this population?

The study

Ely *et al.* [1] addressed this difficult question in a prospective cohort study of mechanically ventilated patients. Those investigators attempted to achieve two objectives: validation of the CAM-ICU and estimation of the occurrence rate of delirium in this population. The CAM-ICU uses standardized nonverbal assessments to evaluate four features of delirium: acute onset or fluctuating course, inattention, disorganized thinking and altered level of consciousness.

A total of 80 patients (83.3%) out of the 96 evaluated developed delirium. The CAM-ICU, administered by two study nurses, had high sensitivity (93–100%), high specificity (98–100%) and high inter-rater reliability ($\kappa = 0.96$, 95% confidence interval 0.92–0.99) as compared with assessment done by delirium experts who based their diagnosis on the criteria of the *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition [8]. The CAM-ICU also performed well when evaluating specific subgroups (those aged ≥ 65 years, those with suspected dementia, and those with Acute Physiology and Chronic Health Evaluation II score ≥ 23). The mean time required to administer this test

was 2 min. Ely *et al.* also showed that 10.4% of patients had persistent delirium symptoms at hospital discharge.

Ely *et al.* [1] concluded that delirium is a frequent occurrence in mechanically ventilated patients, and that CAM-ICU is a rapid and valuable tool to diagnose this condition.

Comments

A new tool for nonpsychiatrists

Ely *et al.* [1] should be congratulated for this work. The advantages of the CAM-ICU are clear and include ease of administration and its high reliability. The most notable contribution is the use of simple objective tests or scales that are not dependent on the patient's ability for verbal expression to assess the presumed cornerstones of delirium (i.e. altered level of consciousness, inattention, rapid onset and fluctuating course). It would have been interesting to know which CAM-ICU items were most commonly positive.

The high sensitivity and specificity reported are not surprising, bearing in mind the fact that the CAM-ICU and *Diagnostic and Statistical Manual of Mental Disorders*, fourth edition [8] share almost identical elements. However, the findings do suggest that a well trained nonpsychiatrist can detect delirium reliably. Nonpsychiatrists are known to have a potential for misdiagnosing delirium [9], but the CAM-ICU could change this.

An important occurrence rate

Ely *et al.* [1] reported an occurrence rate of 80%, which is higher than has been reported in the literature overall and in other studies [2,6,10]. Such a discrepancy might in part be explained by the nature of the studied population (medical, surgical, or mixed; mechanically ventilated patients), use of sedative and analgesic agents, and severity of illness. This high occurrence rate for delirium also raises the issue of delirium phenomenology in ICU. Alterations in levels of consciousness and subsequent attention deficit are frequent features of the critically ill population, largely because these patients receive drugs that cause these features. These constitute overlaps with characteristics in the diagnosis of delirium.

One could also ask about the treatment that those patients received. The authors mentioned a mean duration of delirium of 2.4 days. Were the delirious patients treated according to a standardized protocol?

From a purely statistical point of view it is clear that, although the CAM-ICU has very good sensitivity and specificity, positive and negative predictive values could change in a setting in which the incidence of delirium were lower [11]. Finally, reinclusion of patients with a history of psychosis or neurological disease (great 'delirium mimickers'; excluded in the study for validation purposes) could lower the specificity of the CAM-ICU.

Impact

This elegant work calls for further study of delirium. First, we need to have a more thorough view of risk factors for the development of delirium in critically ill patients. A recent study that used multivariate analysis [2] showed that hypertension, smoking history, abnormal bilirubin and use of morphine are associated with development of delirium. Another study [10] showed that conditions such as respiratory disease, infections, fever, anaemia, hypotension, hypocalcaemia, hyponatraemia, azotaemia, elevated liver enzymes, hyperamylasaemia, hyperbilirubinaemia and metabolic acidosis were predicting factors for the development of delirium. Some of those factors are difficult to modify whereas others give insight into possible interventions. Biochemical and metabolic aspects should not be neglected because imbalances, for example in the insulin-growth factor-1 and somatostatin axis, have been forwarded as contributing factors to the development of delirium [12].

Approaches to the management of delirium have also been relatively neglected. Basic recommendations include treatment of the medical condition, correction of metabolic disturbances, removal of offending agents and use of antipsychotics. Haloperidol has been the most utilized [13], but the use of new drugs with few side effects holds promise [14].

Finally, the consequences of delirium need to be explored. During the ICU stay delirium has been associated with greater self-extubation and reintubation rates [2]. Ely *et al.* [3] have also shown that delirious patients stayed longer in the ICU. A recent study [15] showed that the occurrence of delirium in older hospitalized patients was a strong independent predictor of mortality [15]. Long-term consequences of delirium must be carefully studied, and the data reported by Ely *et al.* [1] are provocative and call for further research in this field.

Conclusion

The study conducted by Ely *et al.* [1] is important and pertinent to the diagnosis and management of delirium in the ICU setting. We believe that every critical care nurse and physician must try to incorporate tools to target and diagnose delirious patients better. CAM-ICU may definitely be one of them.

Competing interests

None.

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