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Neurocognitive Problems in Critically Ill Older Adults: The Importance of History

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Older adults are at greater risk for development of neurocognitive problems during critical illness than their younger counterparts,¹ particularly if they have pre-existing cognitive impairment.² Neurocognitive problems result in longer duration of mechanical ventilation and extended ICU and hospital lengths of stay.^{3, 4, 1, 2} These problems can persist after discharge and affect quality of life for both the patient⁵ and family caregivers.⁶ Accurate assessment of neurocognitive status necessarily guides selection of interventions.

Consider the case of Mrs. Crane, an older woman who developed flank pain, nausea, vomiting, and altered mental status while travelling with her husband. She was first admitted emergently to a community hospital and then transferred to the University Medical Center with a diagnosis of intrahepatic abscesses. She developed septic shock and renal failure, and was intubated and mechanically ventilated shortly after admission to the University Hospital. Medical management included vasopressor medications for hypotension and intermittent hemodialysis for acute renal failure.

Mrs. Crane's ICU course was notable for prolonged periods of psychomotor agitation which were treated with intravenous lorazepam, morphine and fentanyl. The sedative and analgesic medications were titrated to manage physiologic (hypertension, tachycardia, tachypnea) and behavioral symptoms (head thrashing, active in bed, facial grimacing, pulling at wrist restraints, "bucking" ventilator, wincing, lifting arms and legs off bed, and "resisting care"). Ventilator weaning attempts were avoided or aborted when agitation was associated with a reduction in ventilator settings. Nurses interpreted these episodes as "anxiety," "agitation," "pain," and "restlessness." Mrs. Crane's agitation was initially attributed to liver pathology; however when liver enzymes returned to normal without resolution of agitation, clinicians struggled to identify a cause. A decreased level of consciousness and inability to speak due to endotracheal tube intubation prevented her from validating or clarifying symptoms by self-report.⁷

Mrs. Crane's daughter, who arrived several days after admission, revealed a history of long standing anxiety disorder and chronic arthritic shoulder pain. Nurses used this information to

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confirm their interpretation of agitation as anxiety and managed the patient's behaviors with combinations of benzodiazepines and opioids.

Incomplete history taking led to gaps in relevant information necessary for accurate diagnosis. This was likely due to 1) original admission to a hospital unfamiliar with the patient, 2) incomplete history at transfer, 3) gaps in the husband's knowledge of relevant patient history, and 4) incomplete questioning of either proxy for relevant neurocognitive history.

Physicians and nurses were conflicted about cause and treatment of agitation in this case. Physicians implemented a plan to facilitate ventilator weaning that included orders for benzodiazepine withdrawal. Nurses, however, viewed Mrs. Crane's physiological and behavioral responses as dangerous and were reluctant to taper the benzodiazepines. They felt unsafe when the patient's behavior escalated as benzodiazepine doses were decreased.

On ICU day 15, haloperidol was added to the pharmacologic regimen for temporary and targeted treatment of agitated delirium. Continuous cardiac monitoring was maintained during therapy with intravenous haloperidol, with careful surveillance for prolonged QT segments. Ironically, after 18 days in the ICU, the family revealed that Mrs. Crane had a history of paradoxical response to benzodiazepines. No one had asked them specifically about the patient's benzodiazepine use prior to hospitalization.

The diagnosis of delirium proved to be a turning point in Mrs. Crane's care. ; With safe⁸ and successful treatment instituted, her mental status gradually improved and agitation subsided. Mrs. Crane was eventually discharged to a neuro-rehabilitation facility closer to her home. Fortunately, her neurocognitive rehabilitation progressed rapidly and Mrs. Crane returned to work as a bookkeeper in the family business.

This case illustrates the difficulties involved in accurate identification of neurocognitive problems experienced by older adults during physiologically complex critical illness in the ICU. Symptom identification was clouded by overlap between several realistic patient states; pain, anxiety, delirium. Symptoms were originally aligned with liver pathology. After the liver pathology subsided, symptoms seemed to correspond with a newly revealed history of anxiety disorder. The diagnosis of delirium did not negate coexisting anxiety or pain but was a more accurate explanation and assessment of the patient's neurocognition. Routine delirium testing at the bedside as well as information about pre-illness neurocognitive function and medication-taking history might have avoided the prolonged diagnostic and management uncertainty experienced in this case.

Important information about a critically ill older patient's cognitive or mental health history is often incomplete or inaccurate because most ICU clinicians rely on proxy information from family members.⁹ Several clinical tools available for assessment of pre-existing cognitive impairment can mitigate the problems of inconsistent and incomplete proxy information. The Modified Blessed Dementia Rating Scale¹⁰ and the Informant Questionnaire on Cognitive Decline in the Elderly¹¹ can be administered to a family member rapidly (less than 5 minutes) to identify pre-existing cognitive impairment in older patients admitted emergently to an ICU.

Admission history taking should also include information about alcohol and drug use as well as other common problems such as depression or chronic pain.¹² Pre-admission use of benzodiazepines has been shown to increase the risk for development of delirium in critically ill older adults.^{13, 14} Nurses must be aware of potential adverse consequences of abrupt withdrawal of benzodiazepines as well as the adverse effect of benzodiazepine treatment for older adults during acute-critical illness.¹⁵

While we have been concerned about the dangers of under-recognition of hypoactive delirium in the acute-critical setting,¹⁶ Mrs. Crane's case illustrates an incomplete understanding of hyperactive delirium, an equally dangerous situation. Accurate bedside diagnosis is further complicated by the different terminology that clinicians use to describe the same condition or behaviors. Overlapping symptom profiles of anxiety, delirium, and pain, can make diagnostic precision even more difficult,¹⁷ and 'anxiety' becomes a catch-all term.

Neurocognitive assessment tools for delirium,¹⁸⁻²¹ anxiety,²² pain²³, and sedation²⁴⁻²⁶ have been validated for use in the ICU even with nonvocal patients. These assessment tools are invaluable in providing common terminology, spotting trends in conditions, and documenting effects of interventions. The successes in Mrs. Crane's case resulted from differentiation between the contributions of history and accurate bedside neurocognitive assessment. Importantly, she received effective treatment for delirium *and* rehabilitation targeted to regain neurocognitive function. The future of care for critically ill older adults needs to include attention to early recognition and treatment of neurocognitive problems as well as neurocognitive recovery after discharge.

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