A Review of Multifaceted Care Approaches for the Prevention and Mitigation of Delirium in Intensive Care Units

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Objective

- To examine the effectiveness, implementation, and costs of multifaceted care approaches, including care bundles, for the prevention and mitigation of delirium in patients hospitalized in intensive care units (ICUs).

Background

- Delirium or acute brain dysfunction affects 35-80% of patients in the ICU and is independently associated with increased cognitive and physical impairment, mortality, hospital length of stay, and health care costs.
- Delirium is a complex condition that may be caused or exacerbated by multiple risk factors or combinations thereof.
- Various multifaceted programs have been designed for ICU and non-ICU settings to address the multifactorial nature of delirium by including elements such as sedation vacations, therapeutic activities, early mobilization, vision/hearing optimization, and sleep enhancement and have shown success in reducing delirium.
- “Care bundles” have been advocated as a means to accelerate the adoption of multiple care processes into routine clinical practice, benchmark performance, and improve patient outcomes.
- The ABCDE and PAD bundles have been proposed as inter-disciplinary, multi-component patient safety intervention in ICUs to reduce incidence of delirium by improving collaboration among clinical team members, standardizing care processes, and breaking the cycle of over-sedation and prolonged ventilation.

Methods

- A systematic search using PRISMA guidelines was conducted utilizing PubMed, EMBASE, and CINAHL.
- Searches were limited to studies published in English from January 1, 1988 to September 30, 2015.
- Randomized controlled trials and comparative studies of multifaceted care approaches with the reduction of delirium in ICU patients as an outcome and evaluations of the implementation or cost-effectiveness of these interventions were included.
- For inclusion, studies had to demonstrate usage of at least two of the following therapies: daily sedation interruption (spontaneous awakening trial [SAT]); daily assessment of patient readiness for extubation (spontaneous breathing trial [SBT]); daily sedation monitoring with a validated screening tool; daily delirium monitoring with a validated screening tool; targeted pharmacological delirium.medication strategies (i.e. protocols for prescription of analgesics and sedatives); non-pharmacological delirium management/medicating strategies (i.e. cognitive stimulation, assistive device use [glasses/hearing aids], sleep preservation); early exercise or mobility protocol.
- Data on study methods including design, cohort size, interventions, and outcomes were abstracted, reviewed, and summarized.
- Green the variability in study design, populations, and interventions, a qualitative review of findings was conducted.

Findings

Effect of Multifaceted Care Approaches on Patient Outcomes

- 3 of the 8 studies found significant reductions in incidence of delirium, duration of delirium, or days patients spent awake and not delirious.
- Several studies reported significant reductions in coma days, ventilator days, and/or hospital length of stay.
- 3 studies found significant reductions in sedative and analgesic use.
- 2 studies observed significant reductions in mortality.
- 2 studies observed significant improvements in functional status.

Implementation of Multifaceted Care Approaches

- Implementation strategies included structured educational processes, ongoing audit and feedback, and use of multidisciplinary teams of ICU physicians, nurses, pharmacy representatives, delirium experts, and rehabilitation therapists.
- A few studies observed significant increases in delirium screening, sedation monitoring, and physical therapy consults following implementation of multifaceted care approaches.
- Common barriers to implementation included difficulties educating physicians and nurses, lack of physician and nurse compliance, and time, perceptions that administration of the protocol was difficult, documentation burden, excessive staff turnover, and fear of patient harm.
- Implementation was facilitated by ICU leadership, respiratory and physical therapist staff dedicated to the ICU, existing quality improvement cultures, clinical champions, and hands-on support from nurse leaders.

Cost-effectiveness of Multifaceted Care Approaches

- The one study that examined cost-effectiveness found that the cost of hospitalization for patients who were treated with a sedation, analgesia, and delirium management protocol was approximately $1,000 less than the costs of hospitalization for a control group.
- The reduction in costs was primarily due to an average one day reduction in length of stay in the intervention group.

Discussion

- Despite the great variation in interventions and measured and observed outcomes in the studies included in this review, we found evidence that utilizing a multifaceted care process for the prevention and treatment of delirium in ICUs may improve patient outcomes including incidence and duration of delirium, coma days, days spent on a ventilator, hospital length of stay, functional status, and mortality rates.
- Significant decreases in the use of sedative and analgesics, which are associated with an increased risk of delirium, were observed in several of the included studies.
- However, 3 of the studies reported no significant differences in incidence or duration of delirium between the treatment and the control groups.
- Reduction in coma rates, heterogeneity among interventions, differences in the existing standard of care in study ICUs, choice of sedation, and poor adherence to intervention protocols likely contributed to the observed variation in outcomes.
- The studies included in this review had many limitations. Some of the studies lacked methodological rigor. Bias may have been introduced through lack of intervention fidelity, failure to control for confounding factors, and inconsistent measurements. Many of the studies were non-randomized pre-post studies and observed improvements may have been caused by temporal trends or other factors that were not controlled for such as choice and level of sedation and incidence of coma.

Conclusions

- Although the studies included in this review have several limitations and are difficult to compare due to the heterogeneity of the interventions, reductions in delirium and improved patient outcomes were observed following the implementation of multifaceted care approaches.
- Greater improvements in ICU care and patient outcomes may be achieved by deploying a standardized, comprehensive bundle of care practices including awakening and breathing trials, delirium monitoring and treatment, and early mobility, such as the ABCDE or PAD bundles.

Implications for Research and Clinical Practice

- New approaches to the delivery of care in the ICU are needed to prevent delirium and improve patient safety.
- The ABCDE and PAD bundles need to be rigorously evaluated and their effectiveness assessed.
- In addition, more data on factors that promote successful adoption of these bundles and their cost-effectiveness are needed.
- Future studies should address these gaps in knowledge regarding the prevention and mitigation of delirium.

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