Editorial

Optimizing sedation in critically ill patients: by technology or change of culture?

Thomas Stroem[1,2], **Palle Toft**[1,2]

[1]Department of Intensive Care, Odense University Hospital, Odense, Denmark; [2]University of Southern Denmark, Odense, Denmark

Correspondence to: Thomas Stroem, MD, PhD. Department of Intensive Care, Odense University Hospital, Odense, Denmark; University of Southern Denmark, Odense, Denmark. Email: t.s@dadlnet.dk.

Provenance: This is an invited Editorial commissioned by the Section Editor Zhongheng Zhang (Department of Emergency Medicine, Sir Run-Run Shaw Hospital, Zhejiang University School of Medicine, Hangzhou, China).

Comment on: Walsh TS, Kydonaki K, Antonelli J, *et al*. Staff education, regular sedation and analgesia quality feedback, and a sedation monitoring technology for improving sedation and analgesia quality for critically ill, mechanically ventilated patients: a cluster randomised trial. Lancet Respir Med 2016;4:807-17.

Submitted Nov 21, 2016. Accepted for publication Dec 09, 2016.
doi: 10.21037/jtd.2016.12.87
View this article at: http://dx.doi.org/10.21037/jtd.2016.12.87

Standard care of critically ill patients undergoing mechanical ventilation includes sedation (1). In the last decades several trials have reported a beneficial effect of reducing sedatives. Brook and colleagues reported a beneficial effect of implementing a nurse driven sedation protocol (2). Kress and colleagues reported a beneficial effect of a daily interruption of sedation (3). The daily interruption of sedatives was also reported beneficial later in a multicenter trial by Girard and colleagues (4). All these interventions are rather simple yet very effective in terms of reducing length of stay and in the Girard trial even reducing one year mortality. To have this effect the team needs to embrace and implement the change and see it as a beneficial intervention. Otherwise it would be difficult to show the effect of any given intervention. An example of this might be the SLEAP trial by Mehta and colleagues (5). In this trial two "light sedation" strategies were compared: either light sedation or light sedation combined with a daily wake up trial. The authors reported no beneficial effect of performing a daily interruption of sedation. On the contrary one of their findings was that the nursing staff found it troublesome to do the daily wake up trial and this group of patients received a higher total amount of sedatives compared with the control group.

Another interesting way of changing or optimizing the sedative use is presented in a recent paper in *The Lancet Respiratory Medicine* by Walsh and colleagues (6). The trial had a rather complex design. A cluster randomized before and after design assigning patients in four groups at intensive care unit (ICU) level. In the first group the staff received education. In the second group staff received education plus sedation-analgesia feedback. In the third group staff received education plus Responsiveness Monitoring Intervention (RI). The last group received all three interventions. The sedation-analgesia feedback was based on reports to the ICU. The RI was a continuous monitoring device reporting the sedation state as red, amber and green. A total of 881 patients were included in the trial. Patients in these intervention groups were compared to patients admitted earlier in a baseline period. In other words, a historic control group was used. The primary endpoint was the proportion of periods with optimal sedation. The authors reported a beneficial effect of the RI in terms of longer periods with optimal sedation. But no effect from the other interventions.

As mentioned in other comments the trial setup was rather complex with a cluster "before-and after" design not randomizing the individual patient but whole departments (7). Also the analysis of the obtained results was rather complex. What is the overall "take-home" message from this large trial involving more than 800 patients and 8 ICUs? The authors reported some effect of a continuous monitoring device, warning the personnel with a red color if the patients were too deeply sedated, although the device was not in use for longer periods of time in more than half of the patients. No effect was proven from

Figure 1 Less or no sedation might reduce the need for sedation monitoring in the future (shown with permission from the patient).

education alone or monthly feedback on levels of sedation.

The lack of effect from the other interventions in this trial is very interesting. Like the Mehta trial staff reported interventions to lower sedation troublesome and difficult to understand. The staff was reluctant to see a beneficial effect with these interventions despite education and training. Another very interesting aspect is the 1:1 nurse:patient ratio in the participating ICUs. Lack of staff is often used as the reason for deeper levels of sedation because each nurse has to take care of more than one patient which was not the case in the present trial (8).

When it comes to proving a beneficial effect of monitoring devices in critically ill patients, other modalities have been reported to have no effect. For instance it has been difficult to prove a beneficial effect of an arteria pulmonalis catheter (9). The message here is that monitoring cannot solve any problems on its own. It is the actions made from the observations that are important. In the present trial staff did not necessarily reduce sedation despite a red light on the RI monitoring device.

With respect to sedation many positive interventions have been reported. As mentioned earlier sedation protocols, daily interruption of sedation, mobilization and physical training all have the potential to reduce length of stay (10). Also the use of no-sedation and a 1:1 nurse:patient ratio has been reported to be beneficial and would for most patients eliminate the need of sedation depth monitors (11) (*Figure 1*). Also newer sedatives such as the alpha 2 agonist dexmedetomidine could be another step to lighten the levels of sedation (12,13). Although dexmedetomidine still needs to be further tested especially in comparison to less or no sedation to identify the patients who might profit from this drug (14).

Walsh and colleagues have done a huge effort by conducting the present trial and the Responsiveness Monitoring device is very interesting. But as the authors themselves mention, the device needs further testing to identify its optimal use. For now the evidence points in the direction of less sedation as a common goal for the sake of the patients. This should be achieved by a cultural change in the perception of the correct treatment for an intubated mechanically ventilated patient: these patients can in most cases be safely handled with less or no sedation.

Acknowledgements

None.

Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

References

1. Barr J, Fraser GL, Puntillo K, et al. Clinical practice guidelines for the management of pain, agitation, and delirium in adult patients in the intensive care unit. Crit Care Med 2013;41:263-306.
2. Brook AD, Ahrens TS, Schaiff R, et al. Effect of a nursing-implemented sedation protocol on the duration of mechanical ventilation. Crit Care Med 1999;27:2609-15.
3. Kress JP, Pohlman AS, O'Connor MF, et al. Daily interruption of sedative infusions in critically ill patients undergoing mechanical ventilation. N Engl J Med 2000;342:1471-7.
4. Girard TD, Kress JP, Fuchs BD, et al. Efficacy and safety of a paired sedation and ventilator weaning protocol for mechanically ventilated patients in intensive care (Awakening and Breathing Controlled trial): a randomised controlled trial. Lancet 2008;371:126-34.
5. Mehta S, Burry L, Cook D, et al. Daily sedation interruption in mechanically ventilated critically ill patients cared for with a sedation protocol: a randomized controlled trial. JAMA 2012;308:1985-92.
6. Walsh TS, Kydonaki K, Antonelli J, et al. Staff education, regular sedation and analgesia quality feedback, and a sedation monitoring technology for improving sedation and analgesia quality for critically ill, mechanically ventilated patients: a cluster randomised trial. Lancet

Respir Med 2016;4:807-17.
7. Riker RR, Fraser GL. Sedation quality in intensive care: which interventions work? Lancet Respir Med 2016;4:767-8.
8. Ogundele O, Yende S. Pushing the envelope to reduce sedation in critically ill patients. Crit Care 2010;14:339.
9. Harvey S, Harrison DA, Singer M, et al. Assessment of the clinical effectiveness of pulmonary artery catheters in management of patients in intensive care (PAC-Man): a randomised controlled trial. Lancet 2005;366:472-7.
10. Schweickert WD, Pohlman MC, Pohlman AS, et al. Early physical and occupational therapy in mechanically ventilated, critically ill patients: a randomised controlled trial. Lancet 2009;373:1874-82.
11. Strøm T, Martinussen T, Toft P. A protocol of no sedation for critically ill patients receiving mechanical ventilation: a randomised trial. Lancet 2010;375:475-80.
12. Riker RR, Shehabi Y, Bokesch PM, et al. Dexmedetomidine vs midazolam for sedation of critically ill patients: a randomized trial. JAMA 2009;301:489-99.
13. Pandharipande PP, Pun BT, Herr DL, et al. Effect of sedation with dexmedetomidine vs lorazepam on acute brain dysfunction in mechanically ventilated patients: the MENDS randomized controlled trial. JAMA 2007;298:2644-53.
14. Jakob SM, Ruokonen E, Grounds RM, et al. Dexmedetomidine vs midazolam or propofol for sedation during prolonged mechanical ventilation: two randomized controlled trials. JAMA 2012;307:1151-60.

Cite this article as: Stroem T, Toft P. Optimizing sedation in critically ill patients: by technology or change of culture? J Thorac Dis 2016;8(12):E1676-E1678. doi: 10.21037/jtd.2016.12.87

