SCCM Choosing Wisely KEG meeting September 15, 2021

Choosing Wisely: Vasopressin Stewardship: Less or More?

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Slides are available on SCCM Connect - Choosing Wisely KEG website

- Why is vasopressin cost of interest? Vasopressin was rebranded in 2014. As of 2017 the average cost of vasopressin per patient was over $850
- Many ICUs are looking at different strategies to optimize cost and reduce waste
- Initiation of vasopressin (AVP)
    - There is controversy on when to start AVP. One survey of critical care pharmacists was almost equally split between starting AVP at lower dose NE (<30 mg/min) and higher dose NE
    - A lot of work has been done looking at the response rate of AVP based on NE dose. One study found there was no higher response rate based on lower dose versus a higher dose – may be safe to push NE dose higher before initiating AVP.
    - Cleveland Clinic implemented algorithm in the MICU to ask nurses to not ask for AVP order until NE dose above 50 mcg/min; also have AVP as the first drug discontinued. This was based on their work and Vanderbilt had implemented similar protocol and found to be safe
    - Evaluated pts in MICU for 1 yr before and after intervention. Over 500 pts per group. Decreased proportion of patient who received AVP by 15% and starting NE dose was about 10 mcg/min higher than before launching algorithm
    - Did not impact time to achieving MAP at goal or need for additional catecholamines or corticosteroids
    - Primary outcome: Mortality over time. Did not detect difference in monthly mortality trend over time.
    - Secondary outcome: Vasoactive cost per patient. Did not detect difference in median total vasoactive cost per patient. In aggregate saved about $40k.
    - Additional finding: AVP was started at higher NE dose but their baseline NE dose at AVP initiation was higher than expected. One study evaluated with NE dose at AVP initiation and evaluated the probability of mortality. Compared with a NE dose of 10 mcg/min, pts initiated on AVP when on higher NE doses had higher adjusted mortality. There was a linear predicted probability between mortality and NE dose at which AVP was initiated. They are now considering starting AVP at lower NE doses based on these results.
    - AVP is a cost-effective therapy. Cost effectiveness analysis revealed AVP was estimated to be 88% cost effective at a threshold of $100,000 per QALY gained.
    - It is important to understand your local AVP use practices before attempting to implement any changes. They are targeting AVP initiation at 15 mcg/min NE but that may not be appropriate for all institutions.
- Cessation of AVP
    - Recent meta-analysis – DC NE before AVP was independently associated with the significant reduction in odds of developing clinically significant hypotension.
    - When AVP dc first, about 40% of patients met composite endpoint of hypotension due to requiring increased NE dose. This does not impact global clinical outcomes.
    - Cost implications: Can save 1-3 bags AVP if you discontinue AVP before NE

    - When to discontinue second agent? Not as much data available; trials have discontinued AVP at different doses of NE
    - Likely DC strategy doesn't matter once the patient is in the recovery phase. AVP administration increases plasma vasopressin level; however, plasma vasopressin levels decrease dramatically once AVP administration is discontinued, especially in the early phases of septic shock.
- Conclusions:
    - Discontinue vasopressin before norepinephrine
    - May need to increase norepinephrine dose to compensate
    - Discontinue once in recovery phase
- Questions
    - How should we treat the group of patients that are 'nonresponders' to AVP? No clear answer. Considerations include determining if patient as adequate cardiac output.
    - The data showing association of higher NE dose at AVP initiation and higher mortality – was this data adjusted for initial severity of illness? Those data were risk adjusted including APACHE, SOFA and other risk factors for mortality
    - The table indicated only 20% of patients received fluid bolus while vasopressors were being weaned. Were these patients assessed for volume status? As we have less vasoconstriction with vasopressor weaning, need to ensure patients are volume replete. No, due to the retrospective nature of the study no assessment for volume status was completed.
    - What is the plasma vasopressin level in the setting of other causes of hypotension? When we give AVP are we hitting those levels or exceeding? Patients with cardiogenic shock have plasma vasopressin concentrations about 30 pg/mL. Exogenous AVP achieves plasma vasopressin concentrations of about 100 pg/ml. We are probably giving too much and this may add weight to the strategy of starting at lower dose and titrating to effect.
    - When you have a new protocol what ideas do you have to encourage adherence? Can do provider or nursing alerts but need to consider smart alerts and get bedside leader buy in.

Attendees:
Jessica Mercer
Anita Reddy
Jerry Zimmerman
Anne Rain Brown
Peter Lindbloom
Ally Hines
Christy Forehand