Risk Factors for Stress Ulceration

Dr RM Kitson, Lead Consultant ICM, Calderdale and Huddersfield FT

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Rationale

- The proposed update of the Ventilator Care Bundle includes a component referring to the balance of risks between utilising stress ulcer prophylaxis and increasing the risk of ventilator associated pneumonia (by micro-aspiration of colonised oropharyngeal secretions, colonisation being promoted by PPI/ H2RA). [6]

- Specifically the bundle stipulates:

> *Stress ulcer prophylaxis*
>
> *The prevention of stress ulcers must be weighed against the increased risk of VAP.*
>
> *There is insufficient evidence to give a clear recommendation of the use of SUP and the potential protective benefits of enteral feeding. We therefore recommend consideration of the risk profile of GI bleeding in each patient with judicious use of SUP in patients considered to be at risk of GI bleeding.*

- And the auditable component states:

> *Stress ulcer prophylaxis should be used judiciously, and only in patients considered to be at high risk of upper gastrointestinal (GI) bleeding. If a patient is prescribed SUP this should be reviewed regularly and specifically when enteral feeding is established.*

- Accordingly, for an auditable standard, 'high risk' should be defined.

High risk patients

- Historically critically ill patients were noted to have high risk of stress ulceration, significant GI bleeding, and thus need for Stress Ulcer Prophylaxis (SUP). This need has been challenged on the basis of advancing critical care standards, and the low quality of the evidence for the efficacy of SUP [1,3].
- Evidence that SUP prevents GI bleeding is equivocal [1-3, 7]. It is beyond the scope of this document to recommend prophylaxis choice, and the role of enteral feeding.
- These risk factors do not apply to patients admitted with GI bleeding (who will presumably be on PPI or H2RAs aleady).

- **Risk factors**:
    - Mechanical ventilation > 48hrs (predicted)
    - Coagulopathy:
        - Platelet count <50 x 10^9/L

        - INR>1.5
        - aPTTr >2
    - 3 or more significant co-morbidities (see appendix)
        - COPD/ CHF/ MI/ CRF/ liver failure/ surgery/ steroids/ immunosuppressed/ coagulopathy
    - Acute Kidney Injury/ Renal Replacement Therapy
    - Liver failure
    - Burns (BSA > 15%)
    - Trauma
        - Traumatic brain injury
        - Multiple trauma (ISS >16)
        - Spinal cord injury
    - Severe Sepsis

References

1. Krag M et al. Stress ulcer prophylaxis versus placebo or no prophylaxis in critically ill patients A systematic review of randomised clinical trials with meta-analysis and trial sequential analysis. Intensive Care Med (2014) 40:11–22
2. Alshamsi et al. Efficacy and safety of proton pump inhibitors for stress ulcer prophylaxis in critically ill patients: a systematic review and meta-analysis of randomized trials. Critical Care (2016) 20:120
3. Marik P et al. Stress ulcer prophylaxis in the new millennium: A systematic review and meta-analysis. Crit Care Med 38(11):2222–2228. doi: 10.1097/CCM.0b013e3181f17adf
4. Cook D, Heyland D, Griffith L, Cook R, Marshall J, Pagliarello J (1999) Risk factors for clinically important upper gastrointestinal bleeding in patients requiring mechanical ventilation. Canadian Critical Care Trials Group. Crit Care Med 27(12):2812–2817
5. Cook DJ, Fuller HD, Guyatt GH, Marshall JC, Leasa D, Hall R, Winton TL, Rutledge F, Todd TJ, Roy P et al (1994) Risk factors for gastrointestinal bleeding in critically ill patients. Canadian Critical Care Trials Group. N Engl J Med 330(6):377–381. doi: 10.1056/NEJM199402103300601
6. Hellyer TP, Ewan V, Wilson P and Simpson J. The Intensive Care Society recommended bundle of interventions for the prevention of ventilator-associated pneumonia. Journal of the Intensive Care Society 2016, Vol. 17(3) 238–243
7. Krag et al. Prevalence and outcome of gastrointestinal bleeding and use of acid suppressants in acutely ill adult intensive care patients. Intensive Care Med (2015) 41:833–845
8. Stress ulcer prophylaxis in the intensive care unit: A multicentre 7-day inception cohort study protocol. http://www.sup-icu.com/upl/website/downloads/Protocolv12final1.pdf
9. Plummer et al. Stress ulceration: prevalence, pathology and association with adverse outcomes. Critical Care 2014, 18:213

10. Young Hwan Choi. A revised risk analysis of stress ulcers in burn patients receiving ulcer prophylaxis. Clin Exp Emerg Med 2015;2(4):250-255. http://dx.doi.org/10.15441/ceem.15.076
11. Barletta J. Stress ulcer prophylaxis in trauma patients. Critical Care 2002, 6:526-530 (DOI 10.1186/cc1831)
12. Rhodes A et al. Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock: 2016. Accessed at http://journals.lww.com/ccmjournal/Abstract/publishahead/Surviving_Sepsis_Campaign___International.96723.aspx

Appendix

Significant co-morbidities (taken from ref [8])

1. History of COPD
2. History of heart failure or myocardial infarction
3. History of chronic renal failure (need for chronic renal support or S-creatinine > 3.6 g/dL / 300 µmol/L prior to hospital admission)
4. History of liver cirrhosis or increased bilirubin
5. Immunosuppression (at least 0.3 mg/kg per day of a prednisolone equivalent for at least 1 month in the 6 months prior to ICU admission)
6. Surgical intervention (elective or emergency) prior to ICU admission
7. Treatment with prednisolone? (at least 0,3 mg/kg/day of prednisolone equivalent for at least 1 month in the 6 months prior to ICU admission
8. Coagulopathy during current hospital admission or at ICU admission? (Platelet count < 50 and/or international normalized ratio (INR) > 1.5)