Newborn Critical Care Center (NCCC) Clinical Guidelines

Hydrocortisone Stress Dosing

Background:

Considerable debate surrounds many aspects of hypotension in neonates, including when and how it should be treated. Stress hydrocortisone dosing has been shown to increase blood pressure in most critically ill newborns—particularly those with vasopressor resistant hypotension.[1,2] However, the use of hydrocortisone in infants without a documented cortisol deficiency has been associated with adverse outcomes including death.[3] Given its efficacy, hydrocortisone is a reasonable therapeutic option for the treatment of hypotension in the newborn but, data to guide its dosing in this population are limited.[4]

Indications for Use:

1. Profound hypotension unresponsive to conventional blood pressure management
2. Profound shock in any infant with suspected sepsis or adrenal crisis
3. Prophylactic treatment prior to a surgical procedure in infants with adrenal insufficiency or a history of chronic steroid therapy*****

* *All infants with a history of chronic steroid therapy should be evaluated for adrenal insufficiency prior to discharge or before surgery when possible (see ACTH (Cosyntropin) Stimulation Test Guidelines).*

Chronic steroid therapy is defined as:

1. ≥ 7 cumulative days of hydrocortisone for profound hypotension unresponsive to conventional blood pressure management or suspected adrenal crisis
2. > 10 days of dexamethasone for chronic lung disease (i.e. multiple DART courses)
3. > 10 cumulative days of steroid treatment (hydrocortisone or dexamethasone) for any indication

DOSING:

Order using "Neo Hydrocortisone Therapy" order set; (includes both stress and prophylaxis order panels)

ALL INFANTS	
Stress Dose:	20 mg/m^2/day divided Q 8 hours
followed by	
Physiologic Dose:	6 mg/m^2/day divided Q 8 hours for 9 doses

Sample Body Surface Area Estimations	
Weight (kg)	**Calculated BSA (m^2)**
0.6	0.08
1.0	0.1
1.5	0.13
2.0	0.15
3.0	0.2

IMPORTANT POINTS:

- **Use the same BSA throughout treatment course**

  Calculation for BSA (m^2) = (0.05 x kg) + 0.05

- Double check that the BSA is calculated using the appropriate weight in EPIC

- If treating vasopressor resistant hypotension order stress hydrocortisone “until discontinued” and determine clinically when infant can wean to physiologic dosing
- May increase stress dose up to 30-40 mg/m^2/day in term infants or dosing q 6 hours if clinical condition warrants
- For extremely low birth weight infants with vasopressor-resistant hypotension, the first dose should be given as a test dose and if the desired response is not observed within 6-8 hours further dosing is not warranted, and the order should be discontinued
- Some infants may require slower weans from stress to physiologic dosing - for example, by 10% (2mg/m2/day) of the original dose daily or every other day
- Use caution when hydrocortisone is used concurrently with indomethacin due to increased risk of GI perforation, each medication carries this risk alone and the risk is even greater when used together
- Prophylactic treatment in the case of suspected/confirmed adrenal insufficiency, hydrocortisone should be started 24 hours prior to surgery/procedure (dosing as above)

References

1. Ng PC, Lee CH, Bnur FL, et al. A double-blind, randomized, controlled study of a "stress dose" of hydrocortisone for rescue treatment of refractory hypotension in preterm infants. *Pediatrics.* 2006;117(2):367-375.
2. Efird MM, Heerens AT, Gordon PV, Bose CL, Young DA. A randomized-controlled trial of prophylactic hydrocortisone supplementation for the prevention of hypotension in extremely low birth weight infants. *J Perinatol.* 2005;25(2):119-124.
3. Peeples ES. An evaluation of hydrocortisone dosing for neonatal refractory hypotension. *J Perinatol.* 2017;37(8):943-946.
4. Watterberg KL. Hydrocortisone Dosing for Hypotension in Newborn Infants: Less Is More. *J Pediatr.* 2016;174:23-26.e21.
5. Ibrahim H, Sinha IP, Subhedar NV. Corticosteroids for treating hypotension in preterm infants. Cochrane Database of Systematic Reviews 2011, Issue 12. Art. No.: CD003662. DOI:10.1002/14651858.CD003662.pub4. Accessed 05 February 2021.