HYPERGLYCAEMIA
Supporting information

This guideline has been prepared with reference to the following:

NHS National Patient Safety Agency. Safety alert: safer administration of insulin. 2010. NHS

(additional note: The NPSA mandated that a training programme should be in place for all healthcare staff expected to prescribe, prepare and administer insulin. A neonatal-specific training package has been devised by Birmingham Women's NICU team, and can be made available.)

Hyperglycaemia increases mortality risk in premature infants?
A prospective chart study of 93 extremely low birth-weight infants (Hays, 2006) found that more than 50% of the infants had persistent blood glucose concentrations of >150 mg/dL during the first week of life. Twenty-two of these infants (44%) had an early adverse outcome, defined as death or intra-ventricular haemorrhage of grade 3 or 4 before the 10th day of life.
Another prospective study in 252 premature infants weighing </=1500 g (Heimann, 2007) found a significant increase in mortality ($p<0.0001$) with increasing median blood glucose level and repeated (>/=4) incidents of blood glucose levels >/=150 mg/dL associated with low gestational age (<27 weeks).
Retrospective analysis of a prospective cohort study of 201 ELBW infants (Kao, 2006) found the odds ratio for either dying or developing a late infection was 5.07 (95% CI 1.06 – 24.3) in those babies with persistent severe hyperglycaemia (>/=180 mg/dL).
A review of the literature (Ogilvy-Stuart, 2010) concluded that hyperglycaemia "is associated with increased morbidity and mortality in preterm infants, but what should be considered optimal glucose control, and how best to achieve it, has yet to be defined in these infants".

Hays SP, O'Brian Smith E, Sunehag AL. Hyperglycemia is a risk factor for early death and morbidity in extremely low birth-weight infants. Pediatrics 2006;118:1811-18

Heimann K, Peschgens T, Kwiecien R, et al. Are recurrent hyperglycemic episodes and median blood glucose level a prognostic factor for increased morbidity and mortality in premature infants </=1500 g? J Perinat Med 2007;35:245-8

Kao LS, Morris BH, Lally KP, et al. Hyperglycemia and morbidity and mortality in extremely low birth weight infants. J Perinatol 2006;26:730-6
http://www.nature.com/jp/journal/v26/n12/full/7211593a.html

Ogilvy-Stuart AL, Beardsall K. Management of hyperglycaemia in the preterm infant. Arch Dis Child Fetal Neonat Ed 2010;95:F126-31
http://fn.bmj.com/content/95/2/F126.long

Evidence Level: IV

Treating hyperglycaemia has a beneficial effect on mortality and morbidity?
A Cochrane Systematic Review of 2 trials in 47 infants (Bottino, 2011) found the evidence was insufficient to answer this question and called for more and larger trials to be conducted.

Bottino M, Cowett RM, Sinclair JC. Interventions for treatment of neonatal hyperglycemia in very low birth weight infants. Cochrane Database of Systematic Reviews 2011, Issue 10. Art. No.: CD007453
http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD007453.pub3/full

Evidence Level: I

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