

Malnutrition Matters, Joint BAPEN and Nutrition Society Meeting, 13–14 October 2009, Cardiff

TPN-associated hyperglycaemia in surgical patients: improving management through ward-based practice

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TPN-associated glycaemic instability and hyperglycaemia are linked to an increased risk of sepsis and cardiac and renal complications⁽¹⁾. Tight glycaemic management in critically ill patients is associated with improved outcome⁽²⁾. The risks of sepsis are particularly high in immediate post-surgical patients who account for a high proportion of in-hospital TPN in our Trust. We undertook an initial audit of monitoring and management of hyperglycaemia in this patient group⁽³⁾, followed by the introduction of a number of simple and inexpensive measures within ward-based practice. We present the results of our subsequent experience and re-audit.

Medical records relating to all post-surgical patients (first 5 days) receiving TPN between January and July 2007 were examined. Our standards included: twice daily bedside glucose measurements and introduction of insulin following more than one reading of blood glucose >8.0 mmol/l.

The following measures were introduced following our initial audit:

- Yellow stickers advising of monitoring and management were placed on the observation charts of all patients receiving TPN by the dieticians.
- Junior doctors from the patient's primary team were asked to attend the nutrition ward rounds where diabetes management was discussed.
- Nursing education was undertaken with a dedicated ward information board, in association with the senior ward sisters.
- Increased scrutiny by the nutrition team of glycaemic monitoring in TPN patients. This was followed by re-audit of 28 patients on TPN to assess the impact of the changes. The results of the re-audit demonstrated a marked increase in identification, surveillance and management of hyperglycaemia amongst this patient group.

	First audit	Re-audit
Number of patients	30	28
Total number of glucose measurements	124	233
Percentage of patients who had at least one 24-h period with no glucoses being measured	63	57
Percentage of patients identified with at least one result >8.0 mmol/l	47	61
Percentage of days audited where blood glucose was not measured at all	36	24
Percentage of days audited where blood glucose was measured at least twice	34	47
Percentage of patients who had more than one result >8.0 mmol/l and insulin was instituted	21	35

We have found that, with the implementation of several simple and inexpensive measures, glycaemic monitoring of patients on TPN can be significantly improved. These interventions have also resulted in almost twice as many hyperglycaemic patients receiving treatment. Further work may be needed to determine the effect of improving patient monitoring in this group.

1. Cheung NW, Napier B, Zaccaria C & Fletcher JP (2005) *Diabetes Care* **28**, 2367–2371.
2. Lin LY, Lin HC, Lee PC, Ma WY & Lin HD (2007) *Am J Med Sci* **333**, 261–265.
3. French L & Trebble T (2008) *Biomed Scientist* **52**, 578–579.