Faltering Growth in a Surgical Neonate

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Clinical Presentation

Baby M was born by planned caesarean section at 31[+1] weeks gestation, because of intrauterine growth restriction (IUGR). His birth weight was 1.025 kg (2nd centile). He developed necrotising enterocolitis (NEC) on day 24, required surgery and a jejunostomy was formed 45cm from the duodenojejunal (DJ) flexure.

History

Baby M was transferred from the local neonatal intensive care unit to Sheffield Children's Hospital at six weeks of age (37 weeks gestation) for ongoing management. His weight was 1.76 kg (0.4th centile) and he was on a mixture of parenteral nutrition (PN) and nasogastric tube (NGT) feeds of expressed breast milk (EBM). His PN and NGT feeds provided a total of 150 ml/kg/day. Feeds were gradually increased to 6 ml/hour x 20 hours (3 hours on, 1 hour off) plus 5 ml orally x 4/day (at the end of his hour off continuous feeds). A total of 65 ml/kg/day (plus 85 ml/kg/day PN).

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Unfortunately, two weeks after transfer the EBM ran out. An extensively hydrolysed infant formula (eHF) with 50% fat as medium chain triglycerides (MCT) was chosen because of baby M's length of bowel and stoma, and was given at the standard concentration of 13%, providing 66 kcal/100 ml.

Over the next few weeks baby M reached the 2nd centile for weight. The formula was gradually increased to 14 ml/hour x 20 hours plus 10 ml orally x 4/day = 83 ml/kg/day, and he continued on partial PN. The limiting factor to increase feeds further was baby M's stoma output. This was as expected given the length of small bowel available for absorption.

During his initial surgery, Baby M's ileocaecal valve and colon were left intact. He went back to theatre to reverse his jejunostomy at eight weeks corrected gestational age (CGA). Feeds were restarted after three days, once baby M had opened his bowels. His NGT came out, and oral feeds progressed well, allowing PN to be stopped completely sixteen days post-operatively. Baby M's weight and length were both between the 0.4th and 2nd centile at this time.

Management

Baby M's feeding plan was 95 ml x 7 feeds per day (to allow him to sleep longer overnight) of an eHF infant formula with MCT, providing 150 ml/kg/day, 99 kcal/kg/day and 2.7 g/protein/kg/day. He started to struggle to meet his target volume, often falling asleep during feeds. After two days of failing to achieve 150 ml/kg/day, his regime was changed. Several options were considered at this time, including replacing his NGT for top-up feeding, concentrating his current formula and changing to a ready to feed high energy eHF with MCT (Infatrini Peptisorb).

The decision was made to start baby M on Infatrini Peptisorb because it allowed his target volume to be reduced to 100 ml/kg/day (as 75 ml x 6 feeds). Baby M accepted the change in formula well and was able to meet his feeding target immediately. He started to demand more, causing his stool output to increase from an average of 5 stools per day to 9 per day. He was started on loperamide, and allowed a maximum of 120 ml/kg/day to prevent him from driving his stool output further. His weight gain was excellent, increasing 260 g in six days and he was able to be discharged home. Shortly after discharge baby M was admitted to his local District General Hospital following non-febrile seizures and was diagnosed with epilepsy. Despite this he continued to grow well (both weight and length 2nd-9th centile) and was reviewed in clinic at a 17 weeks CGA, when weaning advice was given.

Baby M changed to standard formula at 23 weeks CGA and he tolerated this well, continuing to thrive. It was confirmed that he had spastic quadriplegic cerebral palsy, and continues to be seen by his local dietitians, and speech and language therapists, for ongoing support with texture modified foods.

Discussion

Baby M has a complex history, as do many preterm neonates requiring surgical intervention. EBM was the ideal feed for him post-surgery, and it running out shortly after transfer to our unit, highlighted that we must do more to support mothers to continue to express.

This patient is a good example of how the needs of our neonatal patients evolve, both in terms of requirements and feed choice. His needs when on partial PN and with a high output jejunostomy were very different to post stoma reversal, and different again once catch-up growth had been achieved and was able to tolerate a whole protein formula. Infatrini Peptisorb was an ideal formula leading up to and post discharge for this patient. It allowed catch up growth in a smaller target volume. This negated the need for an NGT and allowed a quicker discharge on full oral feeds. Also, as a ready to feed formula, the risks associated with concentrating a powdered formula were avoided and was so much more convenient for baby M's mother.

Disclaimer: This case study has been commissioned by Nutricia and is for healthcare professionals only.

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