A Case of Delayed Cows' Milk Allergy and Faltering Growth

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Joe was born at 38 weeks via C-section weighing 3.3 kg (just above 25th centile). His length was 50.5 cm (**Table One**). He was exclusively breastfed but had difficulty feeding and was a very unsettled, 'refluxy' baby from birth. His weight dropped to the 9th centile after two weeks and a top-up formula feed was advised. This resulted in projectile vomiting two hours after ingestion and constant refluxing, back arching and inconsolable crying. Mum tried various 'comfort', lactose-free and anti-reflux formulas with no improvement.

At three weeks, Joe had surgery to correct tongue tie. Mum continued breastfeeding with top-up feeds but Joe's gastrointestinal (GI) symptoms and growth faltering continued. An antacid (Ranitidine) was prescribed, but after six weeks there was still no improvement.

By two months of age Joe was still projectile vomiting and having frequent, loose, mucousy stools and persistent perianal rash. His weight and length had dropped further to the 2nd and 9th centile lines respectively (**Figure 1**). The GP then suspected a cows' milk protein allergy (CMPA) and advised mum to exclude all milk and soya from her diet and prescribed an extensively hydrolysed infant formula (EHF) for top-up feeds. After a further four weeks with no improvement, the GP referred Joe to the Paediatric Allergy Clinic.

Assessment

At four months of age, Joe was seen by the specialist paediatric allergy dietitian. His weight and height had dropped to just above the 0.4th and 2nd-9th centiles respectively. He was still reluctant to breast or bottle feed and was only having about 90 ml of EHF in 24 hours. His loose, mucousy stools and vomiting continued. Mum was trying to exclude milk and soya from her diet but was still consuming small amounts in cooked foods and hadn't introduced any milk and dairy substitutes. Neither mother nor baby were having any vitamin or mineral supplements. Mum felt Joe was in constant pain and he frequently woke at night crying. She was exhausted and losing weight herself.

As there was a family history of maternal eczema, asthma and hayfever, a pre-weaning panel of skin prick tests to cows' milk, egg, wheat, soya, cod, peanut and sesame was performed. All were negative, confirming Joe did not have IgE-mediated allergies or sensitisations to these foods.

Management

Joe's history suggested delayed (non-IgE mediated) CMPA and, in view of his ongoing faltering growth, symptoms when exclusively breastfed and unresponsiveness to EHF, the following plan was implemented in accordance with current guidelines for the management of severe CMPA.[1-11]

Plan

1. Joe's top-up EHF was replaced with an amino acid formula (AAF), Neocate LCP - recommended as first-line management for infants with faltering growth and persistent GI symptoms.[4]
2. Multivitamin drops containing 10 mcg of vitamin D were recommended in line with Department of Health advice.[12]
3. Mum was encouraged to continue breastfeeding and advised to take 1000 mg of calcium and 10 mcg vitamin D/day.[11]
4. A strict maternal dietary elimination of all mammalian milks (e.g. cow, sheep, goat) and dairy products was recommended for 2-4 weeks to see if symptoms improved, followed by a trial reintroduction of dairy to confirm the diagnosis of CMPA if symptoms returned.
5. Elimination of all forms of soya was also recommended as up to 60% of children with delayed CMPA also react to soya.[3-5, 8, 10, 13]
6. Dietetic counselling was given on transitioning to AAF, allergen avoidance and suitable milk and dairy substitutes for mum.
7. Weight, height and head circumference were measured every 2-4 weeks.

Follow-up

Four weeks later, mum was strictly excluding all milk and soya. Joe was feeding better and having 300 ml/day of AAF. He was more settled, his stools were less frequent, firmer and the perianal rash and projectile vomiting had completely resolved. He was also gaining weight. Both mum and Joe were sleeping better and mum said he was like a different child. She was reluctant to formally reintroduce cows' milk, but reported she had accidently eaten milk-containing gravy, which triggered a severe exacerbation of Joe's reflux and loose stools. The same happened after eating soya ice cream. All symptoms resolved when milk and soya were excluded again, inadvertently confirming the diagnosis of delayed allergies to soya and cows' milk.

At 5½ months, low allergenic solids were successfully introduced. Joe's meals were fortified by adding high energy/ protein foods and AAF, rather than by concentrating the AAF, as this reduces palatability and the increase in osmolality can trigger diarrhoea and vomiting.[14, 15]

By 6½ months, Joe was breastfeeding well and having 400 ml/day of AAF as top-up feeds and mixed in food. His weight, length and head circumference had all increased to around the 9th centile. He still had occasional episodes of reflux and loose stools when mum accidentally consumed dairy and soya. She then decided to stop breastfeeding as she was finding her exclusion diet too demanding.

AAF became Joe's main milk substitute and common allergens, i.e. wheat, egg, fish, shell-fish, sesame and nuts (not whole), were gradually introduced with dietetic support. Joe remained symptom free and had returned to his birth weight and length centiles by 10 months of age. A trial reintroduction of milk and soya was planned for around one year of age to assess the development of tolerance to milk and/or soya, and review Joe's continued need for AAF. Most children with delayed CMPA will tolerate milk by three years of age.[4]

Discussion

Infants with CMPA are known to be at risk of growth faltering due to increased energy requirements from inflammation (skin/gut), disrupted sleep, reduced nutrient absorption, vomiting, diarrhoea, and reduced intake while on elimination diets. Growth stunting has been observed in 9-12% of UK children after a four-week elimination diet, and stunting was more likely with multiple food exclusions.[14-16]

Although guidelines recommend EHFs as the first-line choice for most infants with mild-to-moderate symptoms of CMPA, about 10% will react to the residual peptides and up to 40% of those with persistent GI symptoms will not tolerate EHF.[4, 5, 10, 11, 17]

AAF has been shown to resolve symptoms that did not respond to an EHF, improve energy intake from protein and increase micronutrient intakes, which help to prevent malnutrition, stunting and promote catch-up growth.[14, 15, 17-22]

Joe's, faltering growth and severe GI symptoms that were unresponsive to anti-reflux formulas and medications were typical 'red flag' indicators for when an AAF should be given as first-line management of CMPA, along with removal of all milk proteins (and possibly soya) from the diet.

Summary

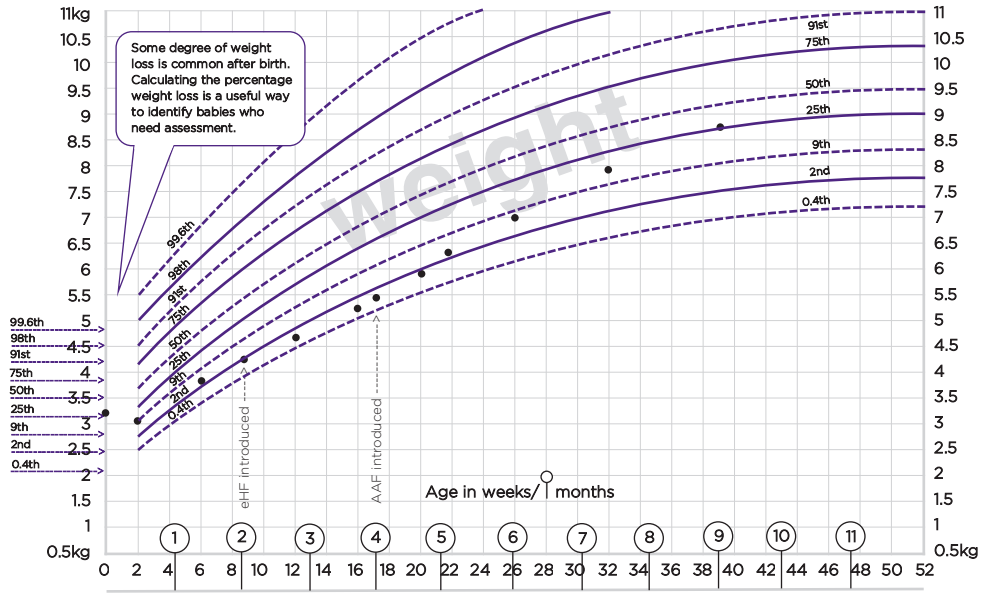
This case study illustrates the importance of early recognition and appropriate management for infants with CMPA to prevent growth faltering and any subsequent impact on their long-term growth and cognitive development. It also highlights the role of specialist dietetic advice and regular growth monitoring in managing these infants and the need for an AAF to achieve symptom resolution where 'red flag' indicators are present.

Table One: Growth History

Age	Weight (kg)	Centile	Length (cm)	Centile	Head circumference (cm)	Centile
Birth (38+5)	3.33	Just >25th	50.5	25th - 50th	34.2	Just >25th
#2 weeks	3.02	9th	51.0	25th	-	-
*2 months	4.29	2nd	55.9	9th	-	-
**4 months	5.21	Just >0.4th	60.1	2nd - 9th	39.8	Just <9th
6 months	6.75	Just <9th	64.3	Just >9th	42.3	Just >9th
9 months	8.35	25th	70.8	25th	44.3	25th
12 months	9.36	25th - 50th	75.2	25th - 50th	45.2	Just >25th

= 10% weight loss from birth; * = eHF started; ** = AAF started

Figure 1: Growth Chart



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