



Case Study: Baby E

4.5 month old girl with Food Protein-Induced Enterocolitis Syndrome (FPIES) to multiple foods and faltering growth

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Clinical Presentation

Baby E is a 4.5 month old girl with faltering growth in a setting of acute FPIES to rice and oat (later to sweet potato) and chronic FPIES to milk (confirmed at 9 months of age with oral food challenge) and soy (not confirmed).

Background

Baby E was exclusively breastfed until 4 months when her mother noticed that her stools were like “watery diarrhoea” and her growth slowed. Her mother stopped eating milk products and replaced with soy but symptoms did not improve. When both milk and soy were discontinued from the maternal diet diarrhoea resolved and growth improved.

At 4 months of age Baby E was introduced to baby rice cereal. A few hours later, she vomited profusely and became limp and lethargic. The next week, she was introduced to baby oat cereal and the same reaction occurred. Mum continued to breastfeed (excluding milk and soy from her own diet) and only introduced Baby E to apple sauce and carrot puree.

Baby E was born on the 50th centile for height and 15th centile for weight. At 4.5 months of age her height was now between the 15th and 50th centiles and her weight between 3rd and 15th centiles (see growth chart).

Baby E has a family history of atopy. Her mother has melon, avocado and latex allergy (IgE mediated) with a history of anaphylaxis.

Management

First appointment (at 4.5 months of age)

Baby E was diagnosed with acute FPIES to rice and oat and advised to introduce corn, but delay introduction of wheat, rye and barley from infant diet. She was also diagnosed with possible chronic FPIES to milk and soy via breast milk^{1,2} and her mother was advised to continue to avoid these from her and her infant’s diet. She was provided with a list of foods to introduce at home - broccoli, cauliflower, pumpkin, berries, peach, plum/prunes, beef, pork, lamb, quinoa cereal, millet - according to IFPIES guidelines³ (see Table 1).

Baby E’s mother was not interested in a supplementary feed despite suboptimal growth and nutritional follow-up was recommended in one month.

Second appointment (at 5.5 months of age)

At 5.6kg, Baby E’s weight had now dropped to the 3rd centile; her length of 62.1cm continued to track between the 3rd and 15th centiles. Her mother was exhausted from breastfeeding and enquired about a supplementary feed. An amino acid formula was suggested due to growth faltering and scheduled cow’s milk FPIES challenge.

Baby E’s mother had read up about “gut health” and the importance of gut bacteria in tolerance development. We chose Neocate Syneo because of the added synbiotic blend, despite the current lack of evidence regarding tolerance development in FPIES. Her energy needs were estimated to be 105 kcal/kg/day (588 kcal) and her protein needs to be 1.82g/kg/day (10.2g protein)⁴.

Mum was recommended to provide about 50% Baby E’s energy requirements from Neocate Syneo (420ml or 15 fl oz of Neocate Syneo which will provide 8.2g protein).

Baby E had tolerated broccoli, berries, peach, quinoa and millet. She was now recommended to increase fruit, vegetables and meat using the IFPIES table and try melon, avocado, fish, rye and barley, cauliflower, lamb, beef, peach, plum, pumpkin and millet.

The importance of protein intake for length gain was emphasized. Baby E’s mother was asked to report on height and weight regularly.

Third appointment (at 9 months of age)

Length: 62 cm (just under 15th centile)

Weight: 5.6 kg (3rd centile)

Baby E reacted to sweet potato at 6.5 months and again to rice and oat at 7.5 months. Milk FPIES challenge was positive at 9 months and soy FPIES challenge deferred until after 12 months of age. Some feeding difficulties were reported with Baby E gagging on any textured foods. Advice was provided on textures and texture progression (to consider referral to feeding team if this does not improve).

Fourth appointment (at 11 months of age)

Length: 70 cm (just under 50th centile)

Weight: 8.2 kg (between 15th and 50th centile)

Baby E is now able to eat much more textured foods - i.e. lumpy food, mashed food, hold foods in hand and feed herself (soft boiled carrot sticks) - with no involvement of feeding team.

She eats 3 meals per day with foods from all food groups:

- Grains (have introduced wheat successfully, now eating corn, rye, barley, quinoa)
- Variety of fruit and vegetables (successfully introduced melon and avocado, avoiding sweet potato)
- Meat, chicken and fish
- Avoiding all soy and dairy (also from maternal diet)
- Taking 6-7 fl oz Neocate Syneo plus 3-4 breast feeds per day

Consequently, growth much improved (see Growth Chart).

Fifth appointment (at 17 months of age)

Height: 80 cm (between 50th centile)

Weight: 10.4 kg (50th centile)

Passed sweet potato and soy challenge and successfully introduced. Breastfeeding discontinued.

Now taking 12 – 14fl oz Neocate Junior with prebiotics since 13 months.

Avoiding: milk, rice and oats.

Discussion

FPIES presents in infancy, a time of rapid growth and development. One of the challenges with FPIES is diagnosing food triggers (by food challenge) whilst ensuring an age appropriate elimination diet. In Baby E's case, goals of management were to

1. Increase diet diversity whilst avoiding known allergens
2. Provide adequate kcal and protein for growth
3. Ensure suitable textures.

Conclusion:

- In this case study Neocate Syneo was successfully used as a supplementary feed in combination with breastfeeding and dietary advice (to optimise dietary diversity and ensure suitable textures) to restore growth in an infant with FPIES to multiple foods and faltering growth.

Product Usage

- ☒ ORAL NUTRITIONAL SUPPLEMENT
- ☐ TUBE FEED
- ☐ SOLE SOURCE OF NUTRITION
- ☒ SUPPLEMENT TO AN ELIMINATION DIET

CALORIE DENSITY: 0.68 KCAL/ML
(STANDARD CONCENTRATION)

Patient Profile

- ☐ ANAPHYLAXIS
- ☐ ATOPIC DERMATITIS (AD)
- ☒ FALTERING GROWTH
- ☒ MULTIPLE FOOD ALLERGIES (MFA)
- ☒ GI SYMPTOMS (FPIES)
- ☒ SYMPTOMATIC ON BREAST MILK
- ☐ SYMPTOMATIC ON AN EHF

TABLE 1. Empiric Guidelines for Selecting Weaning Foods in Infants with FPIES³

Ages and stages	Lower-risk foods*	Moderate-risk foods*	Higher-risk foods*
4-6 months (as per AAP, CoN)	Vegetables		
<i>It developmentally appropriate and safe and nutritious foods are available:</i> <ul style="list-style-type: none"> Begin with smooth, thin purees and progress to thicker purees Choose foods that are high in iron Add vegetables and fruits 	Broccoli, cauliflower, parsnip, turnip, pumpkin	Squash, carrot, white potato, green bean (legume)	Sweet potato, green pea (legume)
6 months (as per WHO)	Fruits		
<i>Complimentary feeding should begin no later than 6 months of age:</i> <ul style="list-style-type: none"> In the breastfed infant, high-iron foods or supplemental iron (1 mg/kg/d) are suggested by 6 months of age Continue to expand variety of fruits, vegetables, legumes, grains, meats, and other foods as tolerated 	Blueberries, strawberries, plum, watermelon, peach, avocado	Apple, pear, orange	Banana
8 months of age or when developmentally appropriate:	High-iron foods		
Offer soft-cooked and bite-and-dissolve textures from around 8 months of age or as tolerated by infant	Lamb, fortified quinoa cereal, millet	Beef, fortified grits and corn cereal, wheat (whole wheat and fortified), fortified barley cereal	Higher-iron foods: fortified infant rice and oat cereals
12 months of age or when developmentally appropriate:	Other		
Offer modified tolerated foods from the family: table-chopped meats, soft cooked vegetables, grains, and fruits	Tree nuts and seed butters* (sesame, sunflower, etc.) *Thinned with water or infant puree for appropriate infant texture and to prevent choking	Peanut, other legumes (other than green pea)	Milk, soy, poultry, egg, fish

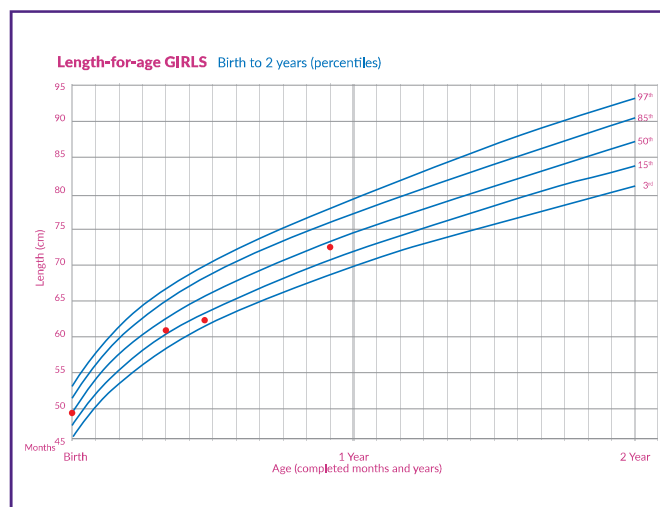
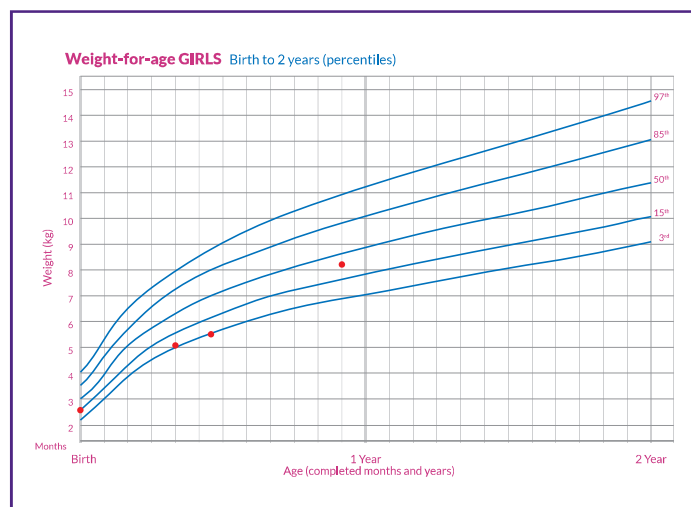
This table should be considered in the context of the following notes:

1. Exclusive breast-feeding until 4 to 6 months of age and continuing breast-feeding through the first year of life or longer as long as mutually desired by both mother and child (Baker RD, Greer FR, Committee on Nutrition American of Pediatrics. Diagnosis and prevention of iron deficiency and iron-deficiency anemia in infants and young children (0-3 years of age). *Pediatrics* 2010;126:1040-50).
2. If an infant tolerates a variety of early foods, subsequent introduction can be more liberal. Additionally, tolerance to one food in a food group (green pea) is considered a favourable prognostic indicator for tolerance of other foods from the same group (legumes; Sicherer SH. Food protein-induced enterocolitis syndrome: case presentations and management lessons. *J Allergy Clin Immunol* 2005; 115:149-56).

AAP, CoN, American Academy of Pediatrics, Committee on Nutrition; WHO, World Health Organization.

*Risk assessment is based on the clinical experience and published reports of FPIES triggers.

Growth Charts for Baby E



References

1. Caubet JC, Ford LS, Sickles L, et al. Clinical features and resolution of food protein-induced enterocolitis syndrome: 10-year experience. *J Allergy Clin Immunol* 2014;134(2):382-9. doi: 10.1016/j.jaci.2014.04.008 [published Online First: 2014/06/02].
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3. Nowak-Węgrzyn A, Chehade M, Groetch M, et al. International Consensus Guidelines for the Diagnosis and Management of Food Protein-Induced Enterocolitis Syndrome: Workgroup Report of the Adverse Reactions to Foods Committee, American Academy of Allergy, Asthma, and Immunology. *J Allergy Clin Immunol* 2017 doi: 10.1016/j.jaci.2016.12.966.
4. Meyer R, Venter C, Fox AT, et al. Practical dietary management of protein energy malnutrition in young children with cow's milk protein allergy. *Pediatr Allergy Immunol* 2012;23(4):307-14. doi: 10.1111/j.1399-3038.2012.01265.x [published Online First: 2012/03/23].