Multiple Allergies as a Contributor to Growth Faltering in a Toddler with Severe Eczema

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Will* is a Caucasian male, born at term by normal vaginal delivery. His birth weight was 4 kg (centile 75-91) and length was 53 cm (centile 75-91). He was predominantly breast-fed for the first six weeks, then combination fed from six weeks to six months. **Figure 1** on the next page outlines his growth history.

*The name of the patient has been changed to protect patient confidentiality.

Background

He was born to a single mum (who had eczema and hay fever as a child), living in poor quality rented accommodation and he had dry skin from birth. This progressed from moderate to severe eczema over six months but no medical attention was sought. Mum stopped breastfeeding as she suspected it was a worsening Will's eczema and tried removing several foods (milk, egg, fruits, wheat, soy).

There followed trials with cows' milk, soy and a hypoallergenic (HA) formula with complementary spoon feeds at six months. Oat 'milk' was given as his main nutrition source at 12 months.

Will presented to his GP with repeated 'viral' chest infections at eight, 10 and 13 months. A radioallergosorbent test (RAST) was conducted at 13 months (**Figure 2**) and exclusion of all foods marked as +1 or above was recommended.

Will was referred to a paediatrician and seen at 16 months. He was noted to look 'miserable' with generalised inflamed itchy oozing skin and his weight and height were deviating from his typical growth history (**Figure 1**).

Dietetic referral

Will was referred to a dietitian at 18 months for an assessment of growth faltering, see **Table One**. Upon conducting an allergy focused clinical history and exam, it was noted that multiple foods were being excluded from Will's diet (milk, citrus, tomato, fish, red meat, poultry, egg, wheat, soy) to try to improve his skin, even though he had been on most of the foods without consistent reproducible symptoms.

Regular cows' milk and soy containing foods seemed to result in reproducible consistent gut pain, spasm and loose bowel motions after four hours of eating. He was first given scrambled egg at nine months; he ate the first teaspoon, vomited, refused to eat more and was very upset for two hours after. Mum was avoiding chicken because of his reaction to egg and red meat because of suspected milk allergy and he had never eaten nuts.

Figures 3 and **4** summarise a typical day's food, which was limited in variety, texture and quality. Nutrition analysis highlighted many concerns; specifically, a high intake of sugar and a less than ideal intake of calcium and vitamin D for bone health, iron and B vitamins for blood health, and the trace elements, zinc, copper and iodine, essential for normal growth.

Final diagnosis

Growth faltering secondary to:

1. Increased requirements due to:
   - Metabolic demands of chronic aggressive atopic eczema
   - Increased cell turnover
   - Infected skin, itch/scratch cycle
   - Anaemia due to chronic low level bleeding through infected skin and low dietary iron intake.
2. Anorexia exacerbated by inadequate quality and quantity of food, physiological and psychological stress, sleep deprivation and exhaustion.
3. Insufficient calorie intake, inadequate protein:energy ratio, compromised micronutrient and vitamin intakes due to unjustified multiple food exclusions.

Immediate management

Symptomatic aggressive treatment of eczema with a routine of emollients and topical corticosteroids with antibiotic and antifungal additives, nutrition support and referral to a paediatric allergist.

Nutrition support

Supplemental iron drops were commenced at the recommended dose and vitamin D drops, which had never been given consistently, at 5 µg per day.

Figure 1: Growth Record from Birth to 2 Years

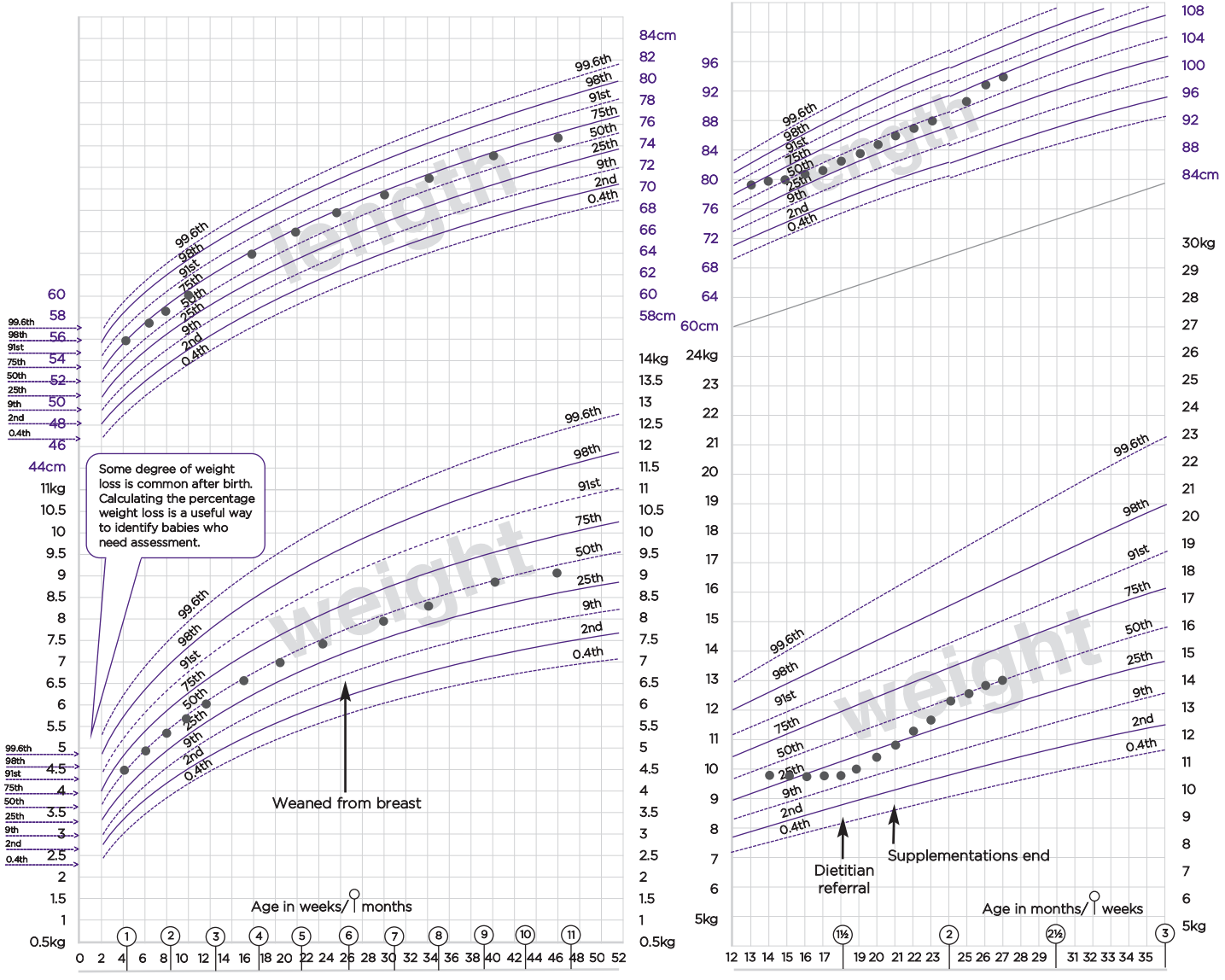

Table One: Dietetic Assessment

Investigation	Findings	Clinical Significance
Weight and height history	Both dropping from centile 75 to 25	Growth faltering over previous six months
Full blood count due to pallor	Hypochromic, microcytic anaemia	Lethargy, anorexia
Skin SCORAD	Severe infected eczema	Chronic itch-scratch, dehydration, infection High cell turnover
Specific IgE to milk, egg and peanut only	Egg IgE 18 kU/l Milk IgE 6 kU/L Peanut IgE 18 kU/l	Sensitisation via his skin is likely to lead to multiple false positive results, hence only these three were tested based on allergy focused history
Diet and feeding history	Mum has received many mixed messages and is totally confused. Multiple attempts made at manipulating/eliminating food	Highly inappropriate age and stage diet quality, quantity and food texture

Due to the significant level of stress for both mother and child, misinformation and mixed messages received around food allergens and the priority for restoring linear growth and weight gain, a nutritionally complete amino acid follow-on formula (nutritionally complete amino acid formula [AAF] for children >1 year) was prescribed for a six-week trial as a supplement to a meal plan of tolerated foods.

The intention for using a specialised formula at 18 months of age was to address calories, the protein:energy ratio needed for catch up weight gain and also vitamin and micronutrient deficiencies. Squash was gradually substituted with nutritionally complete a AAF for children >1 year 660 ml over the day and extra water was encouraged if thirsty.

The rate of weight and linear height gain over the next six weeks indicated a trend towards his previous growth trajectory, at/or near the 50th centile. In parallel, the AAF was continued for a further six weeks until he was following and maintaining his growth curve, at which point it was discontinued. Anaemia resolved within six weeks and supplemental iron was discontinued. Vitamin D drops continue long-term.

He was urgently seen by a paediatric allergist who diagnosed atopic eczema, and IgE-mediated food allergy to egg and peanut. Baked egg and baked milk were well tolerated and included at least three times a week and he is working his way up the egg and milk ladders. It is expected he will outgrow both.

Confirmation and reassurance was provide to Will's mother: there was no risk of immediate allergy to milk, citrus, soy, tomato, fish, red meat, poultry or wheat and all were successfully re-introduced over a six-week period. All other nuts and seeds were introduced into his diet without issue. He is due to have a peanut challenge at age three.

Eczema is well controlled and chronic wheeze is being monitored closely as he is at risk of developing atopic asthma and rhinitis. His living environment is due to be improved. Significant time was taken to re-educate, support and empower Will's mother to manage in the long-term.

Discussion

This case very clearly illustrates the 'Allergic March' in action from birth in a high-risk infant. It also demonstrates the level of stress (physiological/emotional/social) that allergy can cause for child and carer and how this stress impacts on quality of life.

Parents and healthcare professionals need to be educated and supported to recognise and manage allergy, especially when symptoms develop early in life. There are serious potentially growth faltering sequelae of parentally perceived multiple food elimination that are unjustified and unsupported by healthcare professionals.

It highlights the lack of any role for allergy screening or obsolete RAST tests without context and evidence as directed by an allergy focused clinical history. It also demonstrates the clinical evidence that eczema that develops early in life is skin barrier defect that is not caused by food allergy.

Figure 2: Allergy Test Request at 13 Months

RAST	13 months		
Milk	+1	Wheat	+2
Egg	+1	Tomato	+1
Mixed nut panel	+2	Orange	+1
Soy	+2	Fish	+2

Figure 4. Diet History 24-hour Recall

DAY 1	
Breakfast cereal, rice, toasted/crisp, fortified	20 g
Oat milk, unsweetened	135 g
Fruit juice drink/squash, diluted	856 g
Shepherds pie, vegetable, retail	100 g
Rice cakes, plain, low salt	18 g
Bananas, fresh only	80 g

Figure 3. Nutrient Analysis

Nutrient	Intake	Target
Energy (kcal)	410 kcal (57%)	711 kcal
Energy (Kj)	1713 kJ (57%)	2975 kJ
Carbohydrate	82 g (91%)	89 g
Protein	6.7 g (46%)	14.5 g
Fat	6.8 g (24.5%)	
Water	1102 ml	
Free Sugars	16.7 g (188.3%)	
Sodium	435 mg (86%)	500 mg
Potassium	667 mg (83%)	800 mg
Chloride	683 mg (85%)	800 mg
Calcium	35.8 mg (10%)	350 mg
Phosphorus	180 mg (66%)	270 mg
Magnesium	76 mg (89%)	85 mg
Iron	3.7 mg (53%)	6.9 mg
Zinc	1.6 mg (32%)	5 mg
Copper	0.3 mg (69%)	0.4 mg
Manganese	1.5 mg	
Selenium	8.5 µg (56%)	15 µg
Iodine	2.7 µg (3%)	70 µg
Vitamin A (ret eq)	327 µg (81%)	400 µg
Vitamin D	0.9 µg (10%)	8.5-10 µg
Vitamin E	1.3 mg	
Vitamin K_1	0.05 µg (0%)	9.8 µg
Riboflavin (B_2)	0.3 mg (57%)	0.6 mg
Folic Acid (B_9)	67 µg (95%)	70 µg
Vitamin B_{12}	0.4 µg (72%)	0.5 µg
Biotin (B_7)	5.8 µg (5%)	10-200 µg
Vitamin C	11.2 mg (37%)	30 mg

Key message/summary: Recognise risk and stop the March! Identify allergy and intervene early and appropriately.