



GROWTH AND TOLERANCE WITH AN AMINO ACID FORMULA AT A CHILDREN'S CENTER: A TWO-YEAR RETROSPECTIVE REVIEW

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BACKGROUND

- Hypoallergenic amino acid formulas are specifically designed for the nutritional management of children with cow's milk protein allergy, multiple food allergies, food-allergy associated conditions and severe malabsorptive conditions.
- The American Academy of Pediatrics (AAP) and The European Society for Paediatric Gastroenterology Hepatology and Nutrition (ESPGHAN) recommend amino acid formulas to children over 12 months old who cannot tolerate extensively hydrolyzed formulas or formulas containing non-related protein without cross-reactivity.^{1,2}

OBJECTIVES

- The primary objective of this retrospective study was to describe the use of an amino acid formula in children at a rehabilitation pediatric hospital.
- Secondary objectives included growth assessment, achievement of nutrition goals, feeding tolerance and gastrointestinal (GI) medication use.

METHODS

- Retrospective review included children 1 - 18 years of age.
 - Currently or previously resided at a children's hospital with a dedicated rehabilitation center.
 - History of consuming amino acid formula, Alfamino® Junior (AAF, Nestlé HealthCare Nutrition, Bridgewater, NJ, USA).
- In 2018, medical records of all patients consuming AAF were reviewed.
 - Data were recorded at 12 and 6 months before switch to AAF, at formula switch and 6 and 12 months post switch to AAF.
 - Subject records were excluded if they lacked information on use of AAF.
- The learnings from this retrospective study may drive future trials that are powered to answer specific hypotheses.
- Descriptive statistics were computed for continuous measures as means, standard deviations, medians, minimums, and maximums and for categorical measures as counts and percentages to summarize study data (including demographics, diagnoses, medical history, and indication for formula use).

References: 1) American Academy of Pediatrics. Committee on Nutrition. *Pediatrics*. 2000; 2) Koletzko S, et al. *JPGN* 2012

RESULTS

- 26 medical records reviewed, 23 included in analysis (3 excluded due to insufficient AAF formula data).
- Mean age 7.5 ± 5.4 years at time of formula switch, 61% female, 100% tube fed, 70% G-tube.
- Primary diagnoses, indication for amino acid formula use varied beyond allergy (**Table 1**).
- One subject was supplemented with parenteral nutrition at all time points.
- Majority of subjects received one or more nutrition modular, with most common being protein & Vitamin D3.
- Pre-switch formulas varied, with the most common being amino acid formulas for children 1+ years.
- At switch, 100% (86-139%) of calorie and 99% (52-140%) of protein goals were achieved. One year post switch, 99% (88-118%) of calorie and 99% (87-118%) of protein goals were maintained.
- The mean number of GI medications per subject, over 2 year period, ranged from 1.6 – 2.6.
- Six months after formula switch, 10% subjects (2 of 21) had a reduction of 1 or more GI medications; twelve months post switch, 31% (5 of 16) had a reduction of 1 or more GI medications.
- Mean serum markers were within normal ranges at all time points (**Table 2**).

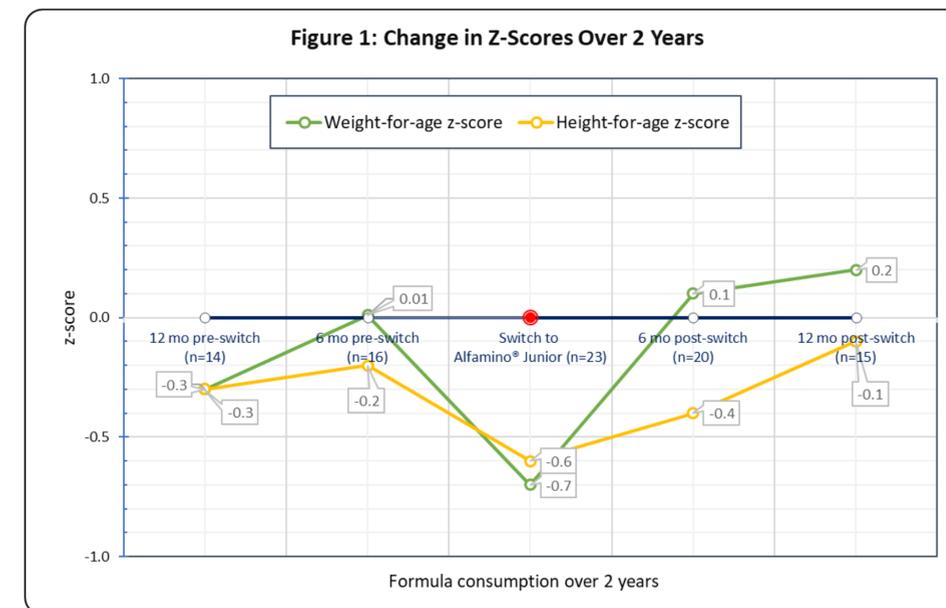
Table 1. Primary Diagnoses (n=23)

Primary Diagnosis (indication for amino acid formula)	N (%)
Allergy (milk, soy, wheat, peanuts, eggs, red dye)	2 (9%)
Atopic dermatitis	3 (13%)
Feeding difficulties	3 (13%)
Gastrointestinal (GI) (atrophic gastritis, delayed GI motility, diarrhea, reflux, flatulence, gastroschisis, vomiting)	11 (48%)
Other (DiGeorge syndrome, chronic transaminitis, FTT, metabolism disorder)	4 (17%)

Table 2: Serum Markers over 2 Years

	12 months pre-switch	6 months pre-switch	Switch to Alfamino®	6 months post-switch	12 months post-switch	Site Normal Values
	N	N	N	N	N	
	Mean	Mean	Mean	Mean	Mean	
Vitamin D (ng/mL)	2	9	14	12	8	30 - 100 ng/mL
Albumin (g/dL)	33.5	40.2	45.6	47.3	49.0	
Phosphorous (mg/dL)	1	12	17	17	12	3.6 - 5.1 g/dL
Calcium (mg/dL)	4.5	3.9	4.0	3.9	4.1	3 - 6 mg/dL [age specific]
Magnesium (mEq/L)	1	7	11	10	10	8.5 - 10.6 mg/dL
	10.2	9.5	9.5	9.6	9.5	
	1	6	10	9	6	
	1.9	2.1	2.1	2.1	2.1	1.5 - 2.5 mg/dL

- Subjects showed consistent growth trajectory across age groups and all time points with anthropometric mean z-scores for weight-for-age of -0.07, 0.2 at switch and 1-year post-switch, respective; length-for-age of -0.6, -0.1, respective (**Figure 1**).
- Weight-for-age mean percentiles at switch and 1-year post were 57% and 60% respectively (CP Growth Charts, N=18); and 28%, 33% respectively (WHO Growth Charts, N=5). Similarly, height-for-age mean percentiles were 47% and 51% (CP Growth Charts, N=18); 23%, and 9th (WHO Growth Charts, N=5, N=1, respective)
- Four subjects with primary diagnosis of vomiting, continued to report episodes throughout the 2-year retrospective review. During AAF consumption, 20-25% of subjects reported vomiting (mean, 3-5 episodes, range of 1 to 11 episodes per day). Average number of stools per subject ranged from 1.5 to 2.1 stools per day over the entire study period with consistently soft mean consistency.



CONCLUSION

- Children consuming this specific amino acid formula had a variety of clinical indications and diagnoses. Amino acid use in children 1 year and older, at this rehabilitation hospital, extended beyond allergic conditions and included malabsorptive and protein intolerance conditions.
- When switching formula and up to 1 year later, children continued to meet nutrition goals, tolerated this amino acid formula and demonstrated consistent growth.
- Overall, a reduction in GI medications was observed after switching to this amino acid formula. After 1 year of formula use, 31% of children had a reduction of GI medications.