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A summary of the HOPA* survey:

The use of extensively hydrolyzed formulas and amino acid formulas in conditions outside of allergy[1]

Meyer, R., Smith, C., Sealy, L., Mancell, S., & Marino, L. V. (2021).[1]
The use of extensively hydrolysed and amino acid feeds beyond cow's milk allergy: a national survey.
Journal of Human Nutrition and Dietetics, 34(1), 13-23.

*HOPA: Use of hypoallergenic formulas outside of primary allergy

Background:

When breast milk is unavailable, extensively hydrolyzed formulas (EHF) and amino acid formulas (AAF) are used for children with a proven cow's milk allergy (CMA). However, these specialized formulas can also be used in other medical conditions where tolerance and absorption are affected. Specifically, EHF/AAF can provide nutritional support in a variety of acute and chronic childhood conditions (outside of allergy) which affect the gastrointestinal tract.[2] Of note, this summary article primarily focuses on the use of EHF.

Aim:

The HOPA survey aimed to describe current clinical practice, including when, how and for whom these formulas are used.

Methods:

Four National Health Service tertiary pediatric centers from the south of England participated in the survey. Data was collected for nine months from February until October 2018.

Objectives for data collection:

1. Provide descriptive information on children prescribed EHF/AAF outside of allergy
2. Identify indications for use of EHF/AAF outside of allergy
3. Identify the route of feeding used (e.g. nasogastric, oral) and the length of time on feed
4. Monitor growth status

Study group:

Inclusion criteria:

Children between 0-18 years consuming EHF or AAF as part of their enteral nutrition (including oral and tube feeding) providing >25% of estimated energy requirements for conditions other than allergic disease.

Exclusion criteria:

Children with confirmed IgE or non-IgE mediated CMA or multiple food allergies which resulted in the prescription of the EHF or AAF. Children on an elimination diet to confirm suspected non-IgE mediated CMA or multiple food allergies. Children with confirmed eosinophilic gastrointestinal disease were also excluded.

Results:

1 Descriptive information on children prescribed EHF outside of allergy

Total number of children recruited = 191

55% male

45% female

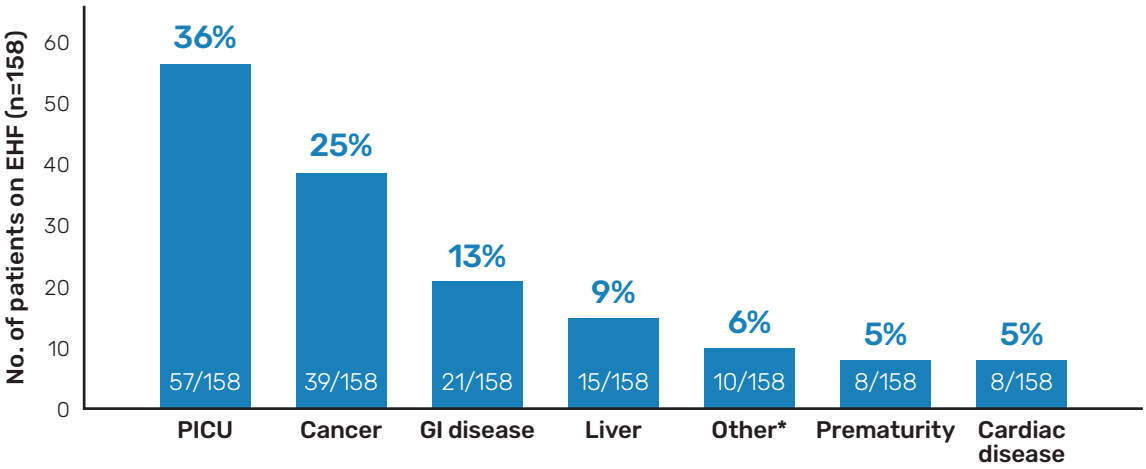
71% inpatients

29% outpatients

Median age: 19 months

83% (158/191) — were receiving EHF

Graph 1. Outlines the diagnostic categories of participants on EHF



*Neurodisabilities, bone marrow transplant, high dependency unit, long term ventilation and chromosomal disorders.
PICU, Pediatric intensive care unit; GI, Gastrointestinal.

2 Identify indications for use of EHF/AAF outside of allergy

When assessing the indications for using an EHF or AAF, 32% responded that this was standard practice in their unit. Of note, one of the four centers uses an EHF as first-line (standard of practice) nutritional management on PICU. 29% used EHF when children were deemed not to tolerate standard whole protein pediatric feeds (see graph 2). A detailed breakdown can be viewed in table 1.

- Standard practice
- Not tolerating standard feeds (whole protein)
- Vomiting
- Gastrointestinal pathology
- Malabsorption
- Diarrhea
- Reflux
- Constipation
- Other

Graph 2. Indications for use of EHF/AAF

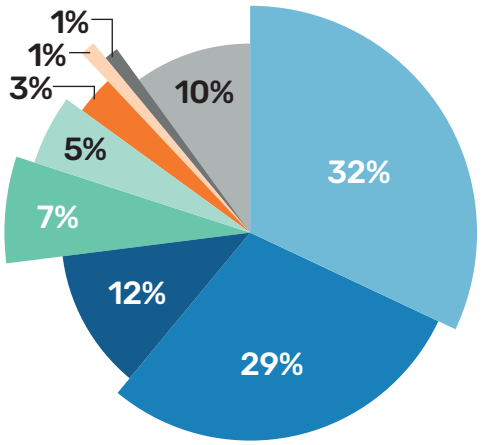


Table 1. Indications for use of EHF/AAF per disease

Admitting unit	Grand total	STD clinical practice	Not tolerating STD feeds	Vomiting	Other symptoms**	Congenital / acquired GI patholoty	Malabsorption	Diarrhea	Constipation	Reflux
PICU All	60	85%	3.3%	0%	10%	1.7%	0%	0%	0%	0%
PICU / Other	45	80%	4.4%	0%	13.3%	2.2%	0%	0%	0%	0%
PICU / Cardiac	11	100%	0%	0%	0%	0%	0%	0%	0%	0%
PICU / Prematurity	4	100%	0%	0%	0%	0%	0%	0%	0%	0%
Cancer	49	12.2%	57.1%	28.6%	2.0%	0%	0%	0%	0%	0%
GI disease	34	2.9%	47.1%	2.9%	5.9%	23.5%	5.9%	8.8%	2.9%	0%
Liver	18	11.1%	0%	0%	50%	5.6%	33.3%	0%	0%	0%
Other*	12	8.3%	25%	41.7%	0%	0%	8.3%	0%	8.3%	8.3%
Prematurity	10	0%	10%	0%	10%	40%	10%	20%	0%	10%
Cardiac disease	8	0%	62.5%	25%	0%	0%	0%	12.5%	0%	0%

* Neurodisabilities, bone marrow transplant, high dependency unit, long term ventilation and chromosomal disorders
** Particularly applicable to children with liver disease
STD, Standard.

How to interpret this table?

The percentage breakdown of reasons for selection of the use of EHF/AAF in cancer patients was: 57% due to not tolerating standard feeds, 29% due to vomiting & 12% as part of standard clinical practice.

3 Routes of feeding & length of time on feed

Routes of feeding:

The survey found that the majority of children were receiving EHF via a nasogastric tube, followed by percutaneous gastrostomy, oral, nasojejunal tube and percutaneous jejunostomy, respectively. Of note, 27% of feeds were used to supplement an oral diet, and 10% of children received their feed (EHF/AAF) orally.

Length of time on feed:

Most children required the formulas for 1-4 weeks (especially those in PICU). However, patients with certain disease categories (e.g. cancer, GI and cardiac disease) required the feeds for a longer duration of feeding; 29% were on either an EHF or AAF for 3-12 months and 7% for >12 months. This highlights the versatility of using EHF in both acute and chronic medical issues.

4 Growth status

Almost 10% of children recruited for this survey were acutely malnourished and almost 40% had persistent malnutrition. Children who were on an EHF for >3 months (compared to < 3 months) had an improved weight-for-height z-score (p=0.02). The impact of the presence of specific symptoms on growth were assessed and it was found that reflux had a negative impact on weight-for-age z-score (p=0.04) and malabsorption had a negative impact on height-for-age z-score (p=0.003). Therefore, reflux and malabsorption need to be monitored and promptly treated so as not to impact growth of the child.

Conclusion:

- This is **the first survey to report the use of EHF/AAF in clinical practice and highlights** the need for a well-designed study to test the effectiveness of EHF in conditions outside of allergy.
- **This survey found that EHF/AAF are widely used in clinical practice,** with most children receiving feeds via the enteral route.
- **The primary aim of using EHF/AAF outside of allergy is to improve tolerance** (vomiting, gastrointestinal pathology, malabsorption, diarrhea, reflux and constipation).
- Healthcare professionals need to be aware that **children on EHF/AAF with complex conditions should be monitored regularly to ensure adequate growth.**

Widespread use of EHF in medical conditions where tolerance & absorption are affected

EHF support improved tolerance in children with malabsorption/ maldigestion

References

1. Meyer, R., Smith, C., Sealy, L., Mancell, S., & Marino, L. V. (2021). The use of extensively hydrolysed and amino acid feeds beyond cow's milk allergy: a national survey. Journal of Human Nutrition and Dietetics, 34(1), 13-23.
2. Eveleens RD, Joosten KFM, de Koning BAE, Hulst JM, Verbruggen SCAT. Definitions, predictors and outcomes of feeding intolerance in critically ill children: A systematic review. Clinical nutrition (Edinburgh, Scotland). 2020;39(3):685-93.

Author acknowledgments

Meyer R_1, Smith C_2, Sealy L_3, Mancell S_4, Marino $LV_{5,6,7,8}$

1. Department Paediatrics, Imperial College, London, UK.
2. Department of Nutrition and Dietetics, Royal Alexandra Children's Hospital, Brighton and Sussex University Hospitals NHS Trust, Brighton, UK.
3. Department of Nutrition & Dietetics, Bristol Royal Hospital for Children, University Hospitals Bristol NHS Foundation Trust, UK.
4. Department of Nutrition & Dietetics, King's College Hospital NHS Foundation Trust, London, UK
5. Department of Dietetics/ Speech Therapy, University Hospital Southampton NHS Foundation Trust, UK.
6. NIHR Biomedical Research Centre Southampton, UK.
7. University Hospital Southampton NHS Foundation Trust and School of Health Sciences, University of Southampton, Southampton, UK.
8. Department of Nutrition & Dietetics, Faculty of Health and Well Being, University of Winchester, Winchester, UK.

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