PEPTAMEN JUNIOR 0.6 The Impact of a Low Energy Partially Hydrolysed Enteral Formula on Feeding Experiences in Children Tube Fed with Neuro-Disabilities: Multicentre Retrospective Study*

Background and Aims: To monitor the effectiveness of a low energy 100% whey-based partially hydrolysed enteral formula on weight management and feed tolerance in tube fed children with a neuro-disability.

Introduction

Nestle

Children with complex neuro-disabilities are unable to meet all **their nutritional requirements orally** and may require a **feeding tube**. Children tube fed with neuro-disabilities and low mobility can become **overweight** due to **reduced energy requirements**¹. Efforts are needed to **protect severely disabled children** from **overfeeding** and to **help families** of children with neuro-disabilities to manage their child's weight.²

Any attempt to dilute the existing feeds to **reduce the calorie intake** to a level commensurate with the energy expenditure of a child with a disability is likely to have **an adverse impact on micronutrient and protein intake**.³

Additionally, feed tolerance is generally worse in children with neuro-disabilities, associated with:⁴

- Comorbidities including epilepsy
- Posture and tone disorders
- **Medications used for the treatment** of these co-morbidities can further exacerbate gastrointestinal symptoms

Materials and Methods

A Retrospective, Multicentre Trial

This is a retrospective, multicentre study conducted across two National Health Service Trusts in UK: one **tertiary centre** and one **district general community hospital**. Data were collected by **paediatric dietitians** from **dietetic and medical records**.



17 children from 1 to 17 years old

Enteral feeding accounted for at least **80%** of their total energy requirements

At least **1 month** trial on a low energy partially hydrolysed enteral formula The clinical nutrition industry has responded to this need and developed enteral formulas that are low in energy but nutritionally adequate for protein and micronutrients, essential for developing children who are reliant on enteral formula to supply a major proportion of their intake.³



Clinical dietetic documentation on feeding tolerance was measured as:

- Either improved
- No change, or worsened and on key markers of tolerance (gastrooesophageal reflux, retching/gagging, vomiting, and stool consistency)
- Stool consistency was assessed with the Bristol Stool scale

Common feed related symptoms associated with neuro-disabilities include: 5

- Constipation was defined as Rome IV Criteria, less than three defecations a week, and painful, hard stools⁶
- Diarrhoea was defined as more than one loose stool a day lasting longer than 7 days 7
- Reflux was defined as parental observation of the passage of gastric contents into the oesophagus causing regurgitation
- Nutrition status (weight for age and height for age) was assessed using Z-scores⁸
- Moderate overweight was identified if Z-scores were between +2 and +3 standard deviation (SD)
- Severe overweight was identified if the Z-scores were above +3 (SD)⁹
- Moderate underweight was identified if z-scores were between -2 and -3
- Energy requirements were calculated on reduced activity at 80% of estimated average requirements¹⁰

*Graeme O'Connor., et al. "The Impact of a Low Energy Partially Hydrolysed Enteral Formula on Feeding Experiences in Children Tube Fed with Neuro-Disabilities: National Multicentre Retrospective Study". EC Nutrition 18.5 (2023): 10-19.

Results

The most frequently recorded neuro-disability of children who had switched to the new enteral formula was cerebral palsy, 8 of 17 children (48%). 94% of the children had gastrostomy feeding tube.

Characteristics

Feed formulas prior to switch included: whole protein (1kcal/ml – 41%), hydrolysed protein (1kcal/ ml – 41%) and amino acid based (18%) based on mean feed volume (ml) excluding water boluses (IQR).

Benefits

The baseline mean **weight** and **BMI Z-scores** were bordering the **moderate overweight**. After **one month** switching to a low energy partially hydrolysed formula both **weight** and **BMI Z-scores decreased**.

80% children reported an improvement in one feeding intolerance symptom after feed was switched.

81% of children had feeding regimens simplified after switching to low energy formula.

Hydration regimen simplified by reducing the need for additional water boluses.

The simplification of feeding plans included: easier to physically transfer child, reduced risk of pressure sores and increased physical activity.

Clinical Outcome



Discussion

The study reported that **76% of families** felt they had **more time** to dedicate to **physical activity/play** after switching to the low energy partially hydrolysed formula, which was largely attributed to simplifying children's feeding regimen.

Unnecessarily complex feeding regimes were prescribed prior to formula switch

- Challenges meeting essential micro-nutrients requirements while reducing total energy intake to avoid overfeeding.
- Overly complicated **feeding plans add further complexity** on the already busy lives of parents caring for children with neuro-disabilities.
- Common practice observed included dilution or significant reduction in total feed volumes, leading to need to add:
 - hydration solutions to meet electrolytes deficiencies,
 - multivitamins to account for the loss from the feed volume reduction/dilution.

Summary

Children with neuro-disabilities who have low energy expenditure coupled with feed intolerances may benefit from a low energy 100% whey-based hydrolysed enteral formula to minimise risk of excessive weight gain, further compromising mobility. Additionally, implementing a low energy hydrolysed 'ready to feed' formula may beneficially impact health economic outcomes by simplifying the feeding regimens – eliminating the need for additional fluid, electrolytes and multivitamins, thereby, reducing time and financial cost attributed to feeding.

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