Understanding the Usage of Oral Nutritional Supplements in Paediatric Enteral Tube Feeding

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The use of oral nutritional supplements (ONS) is becoming increasingly popular in enteral feeding, but little is known and understood about this clinical practice. Feeds exist that are specifically designed for paediatric enteral tube feeding, however, in some patients, it is not clear as to why these aren't considered or are discontinued in favour of using ONS.

A research project was carried out amongst paediatric dietitians practising in the UK to: a) understand the use of paediatric ONS in enteral tube feeding; and b) understand dietetic views of using a paediatric compact-style ONS for enteral tube feeding. A cross-sectional survey was undertaken with responses from 17 paediatric dietitians across 12 acute and community trusts received between November 2016 to June 2017. Furthermore, to capture the early experiences of using a paediatric compact-style ONS in paediatric enteral tube feeding, 11 case studies were collected from two NHS Trusts.

A survey of oral nutritional supplement use in paediatric enteral tube feeding

Paediatric dietitians (n=17) reported that on average 24% of their paediatric enteral tube feeding caseload were using ONS for enteral tube feeding (range 4-80%), which has been calculated as approximately 4,000 patients out of the estimated total paediatric home enteral tube feeding population.

The most commonly used ONS in younger children (aged 1-6 years) and older children (aged ≥7 years) were 1.5 kcal/ml fibre containing ONS (mostly Fortini Multi Fibre, Nutricia; n = 13 for 1-6 years; n = 11 for ≥7 years), followed by 1.5kcal/ml non-fibre ONS (Fortini, Nutricia; n = 10 for 1-6 years; n = 9 for ≥7 years).

The most popular reason for choosing an ONS for paediatric tube feeding patients was based on the 'energy content' (n = 12 for 1-6 years; n = 9 for ≥7 years). Other reasons included 'micronutrient profile/nutritional completeness' (n = 7 for 1-6 years; n = 8 for ≥7 years) and if ONS were considered 'well tolerated' (n = 7 for 1-6 years; n = 8 for ≥7 years).

Dietitians gave the following quotes regarding the benefits of using ONS in paediatric enteral tube feeding:

"Bolus feeding is practical with lifestyle and the presentation of ONS is easy when on the go."

"If the child can drink the supplement they could choose to have it orally or via tube, especially if the supplement tastes good. If childcare cannot facilitate tube feeding the option of drinking the supplement is useful."

"Useful for aspects of bolus feeds; widely used in tube weaning population to encourage oral intake, promote growth and nutritional status."

The survey also asked dietitians to explain any issues they had in using ONS for paediatric enteral tube feeding; of the total responses 27% demonstrated that volume of existing ONS was concerning, as well as inconvenient packaging (20% of total responses).

Some dietitians (n=11) indicated they had or were using adult ONS in paediatric enteral tube feeding patients which they estimated to be the case in 9% of their paediatric enteral tube feeding caseload. The most popular adult ONS choice was adult compact-style ONS (Fortisip Compact, Nutricia) reflected in 44% of overall responses. Adult ONS were perceived as age appropriate for older children (≥7 years) and teenagers, although some dietitians (n = 3) indicated they also used adult ONS amongst the younger paediatric tube fed patients (aged 1-6 years). However, 54% of dietitians had concerns about the risk of exceeding protein and micronutrient Reference Nutrient Intakes (RNI) when using adult ONS in paediatric patients.

Perceptions of paediatric compact-style oral nutritional supplements in paediatric enteral tube feeding

The same group of paediatric dietitians (n=17) were asked to share their views regarding the feasibility and scope of using paediatric compact-style ONS (Fortini Compact Multi Fibre, Nutricia) for paediatric enteral tube feeding. The surveyed dietitians worked in a variety of settings and managed a range of patient groups.

Of the dietitians surveyed, 77% (n = 13) agreed that paediatric compact-style ONS would be useful in paediatric enteral tube feeding patients **(Figure 1)** and approximately one third of their caseloads could benefit. The commonly perceived benefits included (multiple answers could be given) smaller feeding volume (n = 15), shortened feeding time (n = 12) and usefulness in patients requiring fluid restriction (n = 10). The only perceived concern was around high osmolality (n = 2).

Surveyed dietitians agreed that the use of paediatric compact-style ONS in paediatric enteral tube feeding would be feasible amongst:

- All age groups (but more appropriate amongst 4-10 year olds)
- All care settings
- All activity levels
- Most patient groups (but more appropriate for faltering growth and it's co-existence in conditions, such as cardiac and developmental-delay disorders)
- Continuous feeding and bolus feeding (as gravity, syringe or with pump).

The dietitians felt that the use of a paediatric compact-style ONS would be contraindicated in those with: high fluid requirements, intolerance to whole proteins or cows' milk protein allergy, constipation, ketogenic dietary needs, obesity, on high dose treatment in oncology and renal disease.

Early experiences: a summary of case studies using paediatric compact-style oral nutritional supplements for paediatric enteral tube feeding

The dietitians involved in the survey were asked to participate in capturing data on paediatric enteral tube fed patients using a paediatric compact-style ONS (2.4 kcal/ml Fortini Compact Multi Fibre, Nutricia) for enteral tube feeding between April-July 2016. The characteristics of these patients were:

- Mean age 5 years 7 months
- 8/11 male
- Average weight and height <0.4th centile
- 10/11 defined as faltering for growth
- 10/11 had more than one medical condition; primary diagnosis was neurological (27%)
- 6/11 active with assistance and all were cared for at home
- All had gastrostomy tubes, size 6-14 French gauge feeding tubes recorded in n=4 (n=7 missing data)
- 5/11 were likely to require life-long tube feeding
- 6/11 had dysphagia (primary reason for tube feeding)
- 8/11 could take oral diet; 45% of which without restriction (average contribution to overall energy 42%)
- All were either bolus-fed or combination bolus and continuously-fed.

The most common baseline feed used amongst the case study patients was a 1.5 kcal/ml paediatric enteral tube feed (Nutrini Energy, Nutricia) in 6/11 patients, at an average volume of 425 mls per day, contributing on average 42% to overall energy intake. The rationale for this choice of feed was that the energy density was perceived useful in reducing feed time. Only one patient was receiving an ONS as their baseline feed (Paediasure Plus Juce, Abbott). Despite the explanations for baseline feed choice, volume and feed time was still perceived as problematic.

All 11 case study patients used the paediatric compact-style ONS (Fortini Compact Multi Fibre, Nutricia) fed via their gastrostomy tubes. The primary reasons reported for choosing paediatric compact-style ONS by dietitians were for 'elevated nutritional requirements' and 'smaller volume of feed'. For some patients (n=5), the opportunity to orally feed the ONS was also a contributing factor. Some comments from the dietitians regarding why they had chosen a paediatric compact-style ONS for enteral tube feeding included:

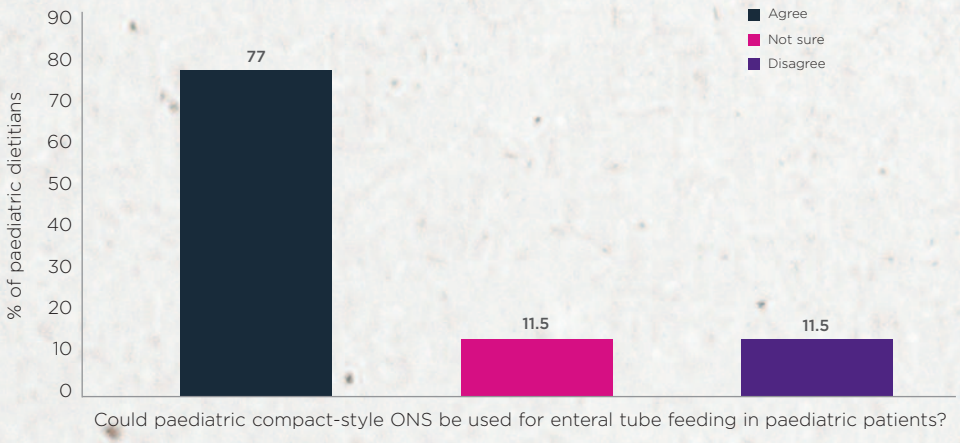
"High kcal, low volume which can be given as a bolus in a single top up. Other ONS larger in volume and would take longer to feed thus affecting family routine and eating."

"Encourages more opportunity for feeding as less time on feed and may help oral intake as child is becoming more food aversive."

"Less volume so less time on feed; could have more boluses to cut out night feed as does not like this, and may eat more."

"Higher kcal, small volume and small bottles easier to carry as parent suffers from neuropathy."

Figure 1: Perceived Usefulness of Paediatric Compact ONS in Paediatric Enteral Tube Fed Patients



The mean volume of paediatric compact-style ONS taken was 312 mls per day and the average energy contribution was 53%. When comparing this to the most common baseline feed the average volume reduced by 113 mls (27%) and the average energy contribution to overall intake increased by 11%. This demonstrates paediatric compact-style ONS can reduce feeding volume, feeding time and enable higher energy intakes. All patients continued to be either bolus-fed or combination bolus and continuously-fed whilst on paediatric compact-style ONS. No issues were reported in the case studies, and neither osmolality or viscosity issues were reported.

In addition, for the case study patients permitted oral intake (n = 8), the average total energy intake was maintained (+3%) demonstrating paediatric compact-style ONS did not negatively impact oral food intake or appetite. This may be attributed to lower feed volume and less time tube feeding which was a desired outcome for both parents and patients, allowing more opportunity to join family meal times.

Comments from the dietitians regarding the benefits of using the paediatric compact-style ONS for tube feeding during the case studies, included:

"Option to sip orally and able to have less volume without compromising kcals."

"Hoping this feed will stop weight loss because smaller volume as smaller boluses and may eat more."

"Ideal in terms of kcals and fibre and tolerance."

Discussion

The use of ONS for paediatric enteral tube feeding is widespread and common in clinical practice across the paediatric dietitians surveyed, with a selection of different ONS being used. The choice of ONS appears to be dependent on energy content, nutritional profile and tolerance, however these reasons are synonymous with paediatric tube feeds. Factors such as the flexibility of use, packaging and practicality of paediatric ONS were identified as drivers in choice which are specific to ONS, over enteral tube feeds. Many dietitians also explained that the ability to transition from intake orally to enteral tube feeding with the same product was more practical, and the presentation of ONS was suitable for feeding 'on the go'. However, some surveyed dietitians viewed the ONS packaging as inconvenient compared to tube feeds and the necessity to decant could be an issue, although paediatric tube feeds exist in 200 ml bottles and compatible giving sets are available.

The case studies showed successful use of paediatric compact-style ONS in all 11 paediatric enterally tube fed patients with mixed diagnoses, including positive feedback from the dietitians regarding the increased calorie intake, reduced volume of feeding, reduced feeding time and improved convenience. Importantly, there were no issues reported from the case studies, in line with the published clinical trial data for Fortini Compact Multi Fibre, Nutricia.[1]

The use of adult compact-style ONS for enteral tube feeding in older children appeared popular in practice amongst some of the dietitians surveyed; however, this may put some children at risk of exceeding protein and some micronutrients RNIs. Paediatric compact-style ONS, such as Fortini Compact Multi Fibre, Nutricia, contains age appropriate levels of protein and micronutrients which may help to reduce the risk of protein overload and excess micronutrient intakes.

Conclusion

In summary, this research highlights how paediatric dietitians interchangeably use ONS as well as specifically designed paediatric enteral tube feeds for enteral tube feeding in clinical practice. Furthermore, paediatric compact-style ONS are an acceptable and flexible ONS, suitable to be used in paediatric enteral tube feeding in addition to its role in paediatric oral nutrition support. Paediatric compact-style ONS such as Fortini Compact Multi Fibre, Nutricia, should be considered for use as a paediatric enteral tube feed, especially in those who are identified with faltering growth and require enteral tube feeding in addition to oral diet, without the burden of large feed volumes or prolonged feeding times.

References: **1.** Sorensen K et al. (2017). Improved compliance, nutritional intakes and growth with a high energy density, low volume paediatric oral nutritional supplement. 4th International Conference on Nutrition and Growth; Amsterdam.

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