TITLE: Nutrition Requirements and Recommendations for Infants Discharged from the Neonatal Intensive Care Unit: Clinical Evidence and Guidelines

DATE: 08 April 2016

RESEARCH QUESTIONS

1. What is the clinical evidence regarding nutritional regimens for preterm infants discharged from the neonatal intensive care unit (NICU)?

2. What are the evidence-based guidelines regarding post-discharge nutritional regimens for preterm infants discharged from the NICU?

KEY FINDINGS

Three systematic reviews, four randomized controlled trials, and one evidence-based guideline were identified regarding nutritional regimens for preterm infants discharged from the neonatal intensive care unit.

METHODS

A limited literature search was conducted on key resources including PubMed, The Cochrane Library, University of York Centre for Reviews and Dissemination (CRD) databases, Canadian and major international health technology agencies, as well as a focused Internet search. No filters were applied to limit the retrieval by study type. Where possible, retrieval was limited to the human population. The search was also limited to English language documents published between January 1, 2011 and March 28, 2016. Internet links were provided, where available.

The summary of findings was prepared from the abstracts of the relevant information. Please note that data contained in abstracts may not always be an accurate reflection of the data contained within the full article.

Disclaimer: The Rapid Response Service is an information service for those involved in planning and providing health care in Canada. Rapid responses are based on a limited literature search and are not comprehensive, systematic reviews. The intent is to provide a list of sources of the best evidence on the topic that the Canadian Agency for Drugs and Technologies in Health (CADTH) could identify using all reasonable efforts within the time allowed. Rapid responses should be considered along with other types of information and health care considerations. The information included in this response is not intended to replace professional medical advice, nor should it be construed as a recommendation for or against the use of a particular health technology. Readers are also cautioned that a lack of good quality evidence does not necessarily mean a lack of effectiveness, particularly in the case of new and emerging health technologies, for which little information can be found, but which may in future prove to be effective. While CADTH has taken care in the preparation of the report to ensure that its contents are accurate, complete and up to date, CADTH does not make any guarantee to that effect. CADTH is not liable for any loss or damages resulting from use of the information in the report.

Copyright: This report contains CADTH copyright material and may contain material which a third party owns copyright. This report may be used for the purposes of research or private study only. It may not be copied, posted on a web site, redistributed by email or stored on an electronic system without the prior written permission of CADTH or applicable copyright owner.

Links: This report may contain links to other information available on the web sites of third parties on the Internet. CADTH does not have control over the content of such sites. Use of third party sites is governed by the owners’ own terms and conditions.
SELECTION CRITERIA

One reviewer screened citations and selected studies based on the inclusion criteria presented in Table 1.

<table>
<thead>
<tr>
<th>Table 1: Selection Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population</strong></td>
</tr>
<tr>
<td><strong>Intervention</strong></td>
</tr>
<tr>
<td><strong>Comparator</strong></td>
</tr>
<tr>
<td><strong>Outcomes</strong></td>
</tr>
<tr>
<td><strong>Study Designs</strong></td>
</tr>
</tbody>
</table>

RESULTS

Rapid Response reports are organized so that the higher quality evidence is presented first. Therefore, health technology assessment reports, systematic reviews, and meta-analyses are presented first. These are followed by randomized controlled trials (RCTs), non-randomized studies, and evidence-based guidelines.

Three systematic reviews, four randomized controlled trials, and one evidence-based guideline were identified regarding nutritional regimens for preterm infants discharged from the neonatal intensive care unit. No relevant health technology assessments were identified.

Additional references of potential interest are provided in the appendix.

OVERALL SUMMARY OF FINDINGS

One systematic review\(^1\) found that nutrient enriched formula post-neonatal intensive care unit (NICU) discharge resulted in improved growth parameters at a minimum of one time point in the studies. Increased protein resulted in increased growth and lean mass accretion. The positive effects were most notable in males. A second systematic review\(^3\) compared nutrient-enriched versus standard formula for preterm infants. There was no difference in growth parameters identified in studies comparing ‘post-discharge formula’ (74 kcal/100mL) with standard term formula (67 kcal/100mL) up to 12 to 18 months.\(^3\) In studies comparing ‘preterm formula’ (80 kcal/100mL) with standard term formula some rates of increased body weight, length, and head circumference were observed.\(^3\) One RCT\(^5\) compared high energy, high protein, medium-chain triglyceride -containing formula with post-discharge formula. There were no significant differences in growth rates or adverse events between the two study groups.

One systematic review\(^2\) examined the multinutrient fortified breast milk versus unfortified breast milk for preterm infants post-NICU discharge. The authors identified two small studies that did not find a difference in growth rates between groups at three or four months after discharge.
from the NICU. One RCT\(^4\) compared the effects of nutrient supplemented breast milk with unsupplemented breast milk at 12 months corrected age. No significant differences were observed between groups in any of the assessed domains.\(^4\) One RCT\(^6\) examined the visual development of preterm infants who were fed either nutrient-fortified breast milk or breast milk alone. Visual development served as a surrogate marker of neurocognitive development. A significantly higher grating acuity was observed in the intervention group at four and six months corrected age.\(^6\) Another RCT\(^7\) compared preterm infants who were fed with fortified breast milk, breast milk alone, or preterm formula. Infants in the formula group had a higher increase in weight z-score until term and in length z-score until six months’ corrected age. There were no significant differences observed between the two breast milk groups in regards to weight, length, or head circumference at 12 months’ corrected age.

One evidence-based guideline was identified from the Academy of Breastfeeding Medicine.\(^8\) The guideline recommends all breastfed preterm infants should receive vitamin K shortly after birth and vitamin D supplementation of 400 IU/day. The guideline also recommends that preterm infants from one to 12 months of age receive 2 mg/ kg/day of elemental iron.
REFERENCES SUMMARIZED

Health Technology Assessments
No literature identified.

Systematic Reviews and Meta-analyses


Randomized Controlled Trials


Non-Randomized Studies
No literature identified.
Guidelines and Recommendations

See: Outpatient: Implementation of Principles of Care

PREPARED BY:
Canadian Agency for Drugs and Technologies in Health
Tel: 1-866-898-8439
www.cadth.ca
APPENDIX – FURTHER INFORMATION:

Randomized Controlled Trials – Setting Unclear


Clinical Practice Guidelines – Methodology Not Specified


See: Post-discharge nutrition

See tables, page 9


Review Articles


Additional References

PhD Thesis