Drug & Poison Information Center—Faculty of Pharmacy—Tanta University

Drug & Poison Information Bulletin

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Early nutrition & brain growth in preterm neonates

In this issue:

Optimizing early nutritional intake in preterm neonates may promote brain health and neurodevelopment through enhanced brain maturation.

Recent study has been published in *Pediatrics*, the official journal of the American academy of pediatrics, showing that the greater energy and enteral feeding during the first 2 weeks of life predicted more robust brain growth and accelerated white matter (WM) maturation.

In this study, magnetic resonance imaging (MRI) has been used to serially scan the brains of 49 preterm neonates with median gestational age, 27.6 weeks to determine the association of energy and macronutrient intake in the first 2 weeks of life with regional and total brain growth and (WM) maturation.

The study found that greater energy and lipid intake predicted increased total brain and basal nuclei volumes over the course of neonatal care to term-equivalent age. Similarly, energy and lipid intake were significantly associated with fractional anisotropy values in selected WM tracts. Furthermore, the association of ventilation duration with smaller brain volumes was attenuated by higher energy intake.

ISO 9001:2015 Certified by IRQS

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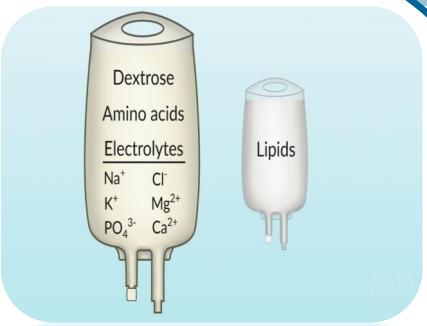
Parenteral nutrition (PN) requirements:

The ultimate goal of nutrition during hospitalization is to ensure a rate of growth close to that of the fetus during the 3rd trimester of pregnancy in order to ensure optimal brain growth.



According to a recent review article, the components for parenteral nutrition for preterm infants could be summarized as following:

Intralipids

Intralipids are an essential component of PN, not only to provide adequate energy, but also to prevent early essential fatty acid deficiency in the extremely low birth weight infant. Maximum hourly infusion rates are standardly recommended at 0.12–0.15 grams/kg/hour (will provide 2.9–3.6 grams of fat/kg/day over 24-houra period). Available alternative options include Omegaven or SMOFlipid, which contain a higher amount of Omega 3 fatty acids in comparison to Omega 6 fatty acids

Protein

Recommended parenteral protein for preterm infants consists of a starting dose of 2–3 grams/kg/day, a transitional dose of 3.5–4.0 grams/kg/day, with a maximum safe dose of 4.0 grams/kg/day.

Dextrose

Dextrose infusion from PN will vary dependent on blood glucose levels, estimated energy needs, and enteral feeding. AND recommends beginning glucose infusion rates between 4–6 mg/kg/minute. The goal range is between 5–15 with maximum of 18 mg/kg/day.

What strategy is best for water and electrolyte supply?

Water intake during the first few days of life is determined according to an individualized progression, taking into account changes in the infant's weight, serum sodium, and to a lesser extent urine output (which is difficult to interpret due to renal immaturity). Most often, initial intakes of 70 mL/kg/24 h are proposed, followed by a progression adapted depending on the infant's characteristics, thermal environment, sodium intakes, type of PN solution used, and clinical and biological parameters, up to approximately 140 mL/kg/day at the end of the 1st week.

What sodium intake is required?

After the first hours to days of life, which are characterized by initial relative oliguria, a diuretic phase lasting a few days will drive the sodium losses. All things considered, a restriction of Na intake less than 2 mEq/kg/day should be considered from the first day but followed by a rapid increase in sodium intake (4 mEq/Kg/day or above adjusted to sodium losses) when sodium losses increase because of increased urine output.

References:

- *Darmaun D, Lapillonne A, Simeoni U, et al. Parenteral nutrition for preterm infants: Issues and strategy. Arch Pediatr., 2018 ; 25(4):286-294.*
- *Schneider J, Fischer Fumeaux CJ, Duerden EG, et al. Nutrient Intake in the First Two Weeks of Life and Brain Growth in Preterm Neonates. Pediatrics. 2018 ; 141(3).*
- *Thoene MK, Anderson-Berry AL. A review of best evidenced-based enteral and parenteral nutrition support practices for preterm infants born <1,500 grams. Pediatr Med., 2018; 1:6.*

By: Marwa EL-Hefnawy, M.Sc.

Talcum powder & cancer risk

What is talcum powder?

⇒ Talcum powder is made from talc, a mineral made up mainly of elements: magnesium, silicon, and oxygen. As a powder, it absorbs moisture well and helps cut down on friction, making it useful for keeping skin dry helping to prevent rashes.

⇒ It is widely used in cosmetic products such as baby powder and adult body & facial powders, as well as in a number of other consumer products. In its natural form, some talc contains ***asbestos***, a substance known to cause lung cancer and other respiratory problems when inhaled.

Does talcum powder cause cancer?

⇒ It is important to distinguish between talc that contains asbestos and talc that is asbestos-free. Talc that has asbestos is generally accepted as being able to cause cancer if it is inhaled. The evidence about asbestos-free talc is less clear. Researchers use two main types of studies to try to figure out if talcum powder or exposure to it causes cancer:

A-Pre-clinical studies: in which animals are exposed to talcum (often in very large doses) to see if it causes tumors or other health problems. These studies have had mixed results, with some showing tumor formation and others not finding any.

B-Clinical studies: these studies looks at cancer rates in different groups of people & compare the cancer rate in a group exposed to talcum to the rate in a group not exposed to it as follow:

⇒ **Ovarian cancer:**

Many studies in women have looked at the possible link between talcum powder & ovarian cancer. It might cause cancer if the powder particles (applied to the genital area or on sanitary napkins, diaphragms, or condoms) were to travel through the vagina, uterus, and fallopian tubes to the ovary.

But these types of studies can be biased because they often rely on a person's memory of talc use many years earlier.

⇒ **Lung cancer:**

Some studies of talc miners and millers have suggested an increased risk of lung cancer and other respiratory diseases, while others have found no increase in lung cancer risk. These studies have been complicated by the fact that talc in its natural form can contain varying amounts of asbestos and other minerals, unlike the purified talc in consumer products. When working underground, miners can also be exposed to other substances that might affect lung cancer risk, such as radon.

⇒ **Other cancers:**

Some limited research has also looked at a possible link between inhaled talc exposure at work and other cancers, such as stomach cancer. But there is no strong evidence of such links at this time. Only one study suggested that genital talcum powder use may slightly increase the risk of endometrial (uterine) cancer in women who are past menopause, but other studies have not found such a link. Further studies are needed to explore this topic.

How can baby powder be used safely?!

- Avoid putting baby powder directly on the genitals. Instead, gently put a light layer on the skin around the genitals and on the legs.
- Avoid getting baby powder in your baby's eyes.
- Keep baby powder away from your face and your child's face to avoid possible inhalation.
- Keep baby powder out of reach of your children.
- Shake out baby powder directly into your hand away from your face.
- Shake powder onto a cloth and then use the cloth to gently pat the powder onto your baby's skin.

References:

- *Talcum Powder and Cancer. available at: https://www.cancer.org/cancer/cancer-causes/talcum-powder-and-cancer.html. Accessed in January 28, 2019.*
- *Is Baby Powder Safe? Available at : https://www.healthline.com/health/is-baby-powder-safe#1. Accessed in January 31, 2019.*

By: Marwa EL-Sayed, PGCPD.

Don't rush to crush oral medications

Sometimes, there may be a need for crushing tablets or capsules contents prior to administering to the patient. These cases include:

- ⇒ Patients on nasogastric tubes which do not permit the administration of tablets or capsules.
- ⇒ Preparing an oral solution for a particular medication may not be available from the manufacturer.
- ⇒ Patients with swallowing difficulties.
- ⇒ The need for mixing of powdered medications with food or drink to make the drug more palatable.

Generally, medications which should not be crushed or altered fall into one of the following categories:

1. Extended release products, which are designed to be slowly released into the body. As a result, it is not suitable to be crushed or altered prior to administration.
Examples: Aciphex , Adalat CC, and Altoprev tablets.
Common abbreviations for extended release products: CD, CR, CRT, LA, SR, TR, TD, SA, or XL.

2. Irritant medications, that may be enteric-coated which delay release of the drug until the time when it reaches the small intestine.
Examples: Enteric-coated aspirin, Bisacodyl, and Actonel tablets in addition to Feldene capsules.

3. Foul-tasting medications, therefore, the manufacturer coats the tablet in a sugar coating to increase its palatability. By crushing the tablet, this sugar coating is lost and the patient tastes the unpleasant tasting medication.
Examples: Cefuroxime tablets and Colace capsules.

4. Sublingual medications. Medications intended for use under the tongue should not be crushed.
Examples: Buprenorphine, Naloxone & Ergomar sublingual tablets.

5. Effervescent tablets. These are tablets which, when dropped into a liquid, quickly dissolve to yield a solution. Many effervescent tablets, when crushed, lose their ability to quickly dissolve.
Examples: Effervescent Potassium tablets.

6. Potentially hazardous substances. Exposure to these substances can result in adverse effects and should be avoided. Crushing or breaking a tablet or opening a capsule of a potentially hazardous substance may increase the risk of exposure to the substance through skin contact, inhalation, or accidental ingestion. The extent of exposure, potency, and toxicity of the hazardous substance determines the health risk. Specific procedures should be followed when handling any potentially hazardous substance. Certain drugs, including antineoplastic agents, hormonal agents, some antivirals, some bioengineered agents, and other miscellaneous drugs, are considered potentially hazardous when used in humans based on their characteristics.
Examples: Alecenza capsules, Bosulif tablets and Cyclophosphamide capsules or tablets.

Recommendations:

⇒ It is not recommended to crush certain medications.
⇒ Revise individual drug monographs prior to crushing pills.
⇒ If crushing a tablet or capsule is contraindicated, consult your pharmacist to determine if other suitable dosage form exists.

Reference:

- ***Oral Medications That Should Not Be Crushed or Altered (Lexi-Drugs Multinational). Available at:https://online.lexi.com/lco/action/doc/retrieve/docid/ multinatf/4667338. Accessed on December 27, 2018.***

By: Bassant Maher, B.Sc

Upcoming conferences in 2019

- ***The 6th Pharmaconex Congress***, 06 - 08 April, 2019 at Egypt International Exhibition Center (EIEC), Cairo. Email: pharmaconex@informa.com.
- **Academics World 591st International Conference on Nanoscience, Nanotechnology and Advanced Materials (IC2NM)**,11-12 May, 2019 at Cairo, Egypt .Deadline For Abstracts/Proposals: 2019-04-03. Email: info@academicsworld.org.
- ***World Congress on Advanced Pharmacy and Clinical Research (WCADPHCLRE-19)***,17-18 June, 2019 at Hotel Novotel Cairo El Borg, Gezira St, Egypt. Paper submission deadline:2ND JUNE 2019.

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