Evaluating The Decision Making Process of Pediatricians' Recommendations for First Complementary Foods in Infants

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GRETCHEN SCHMOYER
Overview

Introduction
  What We Know Today
  Rice Cereal – Helpful or Harmful?
  Purpose of Study

Methods
  Theoretical Framework

Results
  Mothers, Providers, Policy Experts

Discussion

Next Steps
2012: 18% of children 6-11 were obese

Obesity in children has tripled since 1980

Obese children are two times more likely to be obese as an adult

“It’s tricky because everybody likes a chunky baby”

-Provider, Children’s Hospital of Philadelphia


Infants – A Population Overlooked

Little evidence to support whether infant nutrition has positive or negative health outcomes.

American Journal of Clinical Nutrition in 1994 stated 3 critical periods in childhood for the development of obesity:

◦ Gestation and early infancy
◦ Period of adiposity rebound that occurs between 5 and 7
◦ Adolescence

Research response in only 2 of the areas

Why the exclusion?

“Because of the unique nutritional needs, eating patterns, and developmental stages” for infants 0 to 24 months.

The Dietary Guidelines – Expanding Guidance for 2020 - Infant Nutrition’s relationship to long term health outcomes has “grown as a public health interest”


Dietary Guidelines for Americans – Outreach and Education

Guidance on reducing the risk of chronic diseases, including obesity.

December 2015, the most recent version was published and focused on:
◦ “Individuals ages 2 and older in the United States, including those who are at risk of chronic disease”

If childhood obesity negatively impacts adult obesity, should we be intervening earlier?
Current Guidance for Infant Feeding

AMERICAN ACADEMY OF PEDIATRICS

Breastfeeding/Formula Feeding
- Exclusive breastfeeding for the first 6 months (if possible)
- Bottle Feeding: only formula or breastmilk in the bottle

Food Introduction
- Solid foods at 6 months
- Exposure to a “wide variety of healthy foods” and textures

WORLD HEALTH ORGANIZATION

Start receiving food in addition to breastmilk from 6 months onward.

Foods should be appropriate texture for the age of the child

Prepared in a safe manner

Amount of food, frequency and consistency is key.
Healthy People 2020

2020: Inclusion of Early and Middle Childhood
- Healthy People 2010 included this in Maternal, Infant, and Child Health

Early Childhood is 0-8 years:
- Physical
- Cognitive
- Socio-emotional
- Language development

Healthy People 2020 goals for infants pertaining to feeding:
- 60% breastfeed at 6 months
- 35% breastfeed at 12 months


What We Know Today: United States

**FEEDING INFANTS AND TODDLERS STUDY (FITS) – 3022 MOTHERS**

- 76% of infants were fully or partially breastfeed at birth
- At 6 months, declined to 30%
- At 12 months, declined to 16%
- Average age of infant cereal = 4.6 months (Range: .2-15 mos)
- **America is only halfway to Healthy People 2020 goals.**

FITS concluded “more parents and caregivers can benefit from guidance about introduction of developmentally appropriate micronutrient rich first solid foods”

**INFANT FEEDING PRACTICES STUDY II – LONGITUDINAL STUDY CONTINUATION – 1334 MOTHERS**

- 40% of infants were given solid foods earlier than 4 months of age, which is earlier than the recommendations from AAP and WHO.

Mother’s responses:
- Perception of when their child was hungry
- It helped their baby sleep and stay asleep
- Their healthcare provider told them to begin early
- Their own mothers or family members suggested to


What We Know Today: Importance of Iron Rich Foods

Birth – 6 months: .27 mg
7 – 12 months: 11 mg

Heme Iron: meats – more easily absorbed
Non-heme iron: plant source/cereals

**Iron Sources for Complementary Foods**

Spinach – 2.0 – 3.4 mg (4 oz)
Beef – 1.4 – 3.3 mg (2.5 oz)
Liver – 6.2-13.4 mg (2.5 oz)
Infant Cereal – 5.5 mg* (2.5 oz)

*depends on product

“Most babies’ first food is a little iron-fortified infant single grain cereal mixed with breast milk...once your little one gets the hang of eating cereal off a spoon...introduce single-ingredient pureed vegetables, fruit, or meat” –Nemours Foundation

“Rice, oatmeal, or barely? What infant cereal of other food will be on the menu for your baby’s first solid meal?

By tradition, single-grain cereals are usually introduced first. However, there is no medical evidence that introducing solid foods in any particular order has an advantage...” – Healthy Children (AAP).

http://www.healthychildren.org/English/ages-stages/baby/feeding-nutrition/Pages/Switching-To-Solid-Foods.aspx

http://kidshealth.org/en/parents/feed47m.html?view=ptr
Rice Cereal – Helpful or Harmful?

Endorsed by USDA, AAP, and other medical organizations

- Easy to digest
- Least likely to cause allergic reactions
- Contains important nutrients
- Can easily be altered in consistency for any developmental stage

Infant cereals can hide sugars and other nutrients levels not acceptable for an infant.

Rice products are known to contain arsenic, but levels are currently not regulated.

Naturally occurring element in the environment

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https://www.iom.edu/~/media/Files/Activity%20Files/Nutrition/DRIs/DRI_Elements.pdf


http://www.healthychildren.org/English/ages-stages/baby/feeding-nutrition/Pages/Switching-To-Solid-Foods.aspx


Gerber Rice Cereal vs Grain and Fruit Cereal

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Nutrition Facts

<table>
<thead>
<tr>
<th>Serving Size: 1/4 cup (15g)</th>
<th>Servings Per Container: About 15</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calories: 80</td>
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</table>

| Fat: 1-2 g                  |                                |
|-----------------------------|                                |
| Trans Fat:                   |                                |
| Sodium: 50 mg               |                                |
| Potassium: 200 mg           |                                |
| Total Carbohydrates: 12 g   |                                |
| Dietary Fiber: 1 g          |                                |
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Rice Cereal: Other Countries Differ

United Kingdom Food Standards Agency
- Infant rice cereal should not be substituted for breastmilk or formula for children under 4 years old.
- Concerns over arsenic exposure

Swedish National Food Agency
- No rice based drinks for children under 6
- Concerns over arsenic exposure

Denmark
- Limit the intake of rice based cereals
- Concerns over arsenic exposure

European Society for Pediatric Gastroenterology Hepatology and Nutrition: Committee on Nutrition study's on arsenic in infant cereals concluded that arsenic exposure during infancy likely affects long term health, recommending rice intake by infants should be “as low as possible”.

Food Standards Agency. (2009). Survey of total and inorganic arsenic in rice drinks. Food Survey Information Sheet 02/09
The Rice Cereal Debate

PROS
- American’s find infant cereals, including rice, as an important source of iron.
- Easily adaptable for ages/stages
- Low risk of allergic reaction
- Can be a source of grain

CONS
- High levels of arsenic
- Flavor limitations could impact taste preferences later in life
- Introducing more flavorful foods later, rather than earlier could contribute to allergies
- Separation of baby food and family food

This is an example of how the information that is out there for mothers is conflicting.

Food Standards Agency. (2009). Survey of total and inorganic arsenic in rice drinks. Food Survey Information Sheet 02/09
Purpose of this Study

Previous studies captured that mothers were not following the overarching medical guidelines. This study focuses on ‘why’ this may be the case.

The decision making process and understanding from all parties on infant nutrition, specifically, infant rice cereal, was also a point of importance.

This study was comprised of 3 parts

◦ Document the feeding guidelines from medical associations
◦ Understand what pediatricians are recommending to new mothers
◦ Capture the response from mothers on the understanding and personal practices in feeding
Methods

• Mothers, physicians actively involved in pediatric care, and policy creators/advocators/subject matter experts in nutrition policy were interviewed

• 30 minute phone interview, audio recorded and fully transcribed

• Qualitative analysis was conducted through coding by 2 independent coders
## Study Population

<table>
<thead>
<tr>
<th>Mothers</th>
<th>Healthcare Providers</th>
<th>Policy Experts</th>
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<tbody>
<tr>
<td><strong>Criteria:</strong></td>
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</tr>
<tr>
<td>- Infant under 2 years old</td>
<td>- Working in pediatrics – at any position with a minimum of a bachelor’s degree. (pediatric physicians, nurse practitioners, general pediatric nurse, etc.)</td>
<td>- Actively engaged in infant nutrition at the policy level</td>
</tr>
<tr>
<td>- Can have more than 1 child</td>
<td>- May or may not have been in continuing education</td>
<td>- No organizational affiliation required</td>
</tr>
<tr>
<td>- Former colleagues, current acquaintances, or heard of the study through an associate</td>
<td>- Any type of practice was acceptable (inpatient unit, ambulatory care center, etc.)</td>
<td>- Expected to understand how and why certain guidelines were developed/disseminated to their audience.</td>
</tr>
<tr>
<td>- Attempted to represent a mix of non-working, part time, and fulltime mothers.</td>
<td>- Adoptive mothers were excluded due to questions pertaining to conversations while pregnant, as well as discussions around breastfeeding.</td>
<td>- Subject matter expertise in infant nutrition was not required, but policy practices were expected.</td>
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<table>
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<tr>
<th>Participants</th>
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<tr>
<td>- 5 mothers, all had 1 child under 2</td>
<td>- 5 providers</td>
<td>- 3 policy experts</td>
</tr>
<tr>
<td>- 2 mothers first time parents</td>
<td>- 1 physician in pediatrics in the ER, 1 Nurse Practitioner in NICU, 3 physicians in pediatric primary care.</td>
<td>- American Academy of Pediatrics – PA Chapter</td>
</tr>
<tr>
<td>- Employment status: restaurant manager, teacher, physician, claims processor, and active duty military</td>
<td>- 4 of 5 participants’ workplace had a relationship with an academic institution.</td>
<td>- Food, Nutrition &amp; Policy Consultants</td>
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<td>- Columbus Department of Health</td>
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Theoretical Framework – Theory of Reasoned Action

“Behavior intentions, which are the immediate antecedents to behaviors, are a function of salient information about the likelihood that performing a particular behavior will lead to a specific outcome” (Ajzen & Fishbein)
Results
Mothers

GENERAL SENSE OF CONFUSION ABOUT FEEDING PRACTICES

Each of the mothers expressed the constant confusion and conflicting information

“you already know the drill” – Military, mother of 2

“Do your own research and then pick what you want. It’s confusing and for first time parents, it’s really, really, confusing” – Teacher, first time mom

UNAWARE OF GUIDELINES

Two mothers could recite AAP guidelines about breastfeeding

None could speak to complementary feeding

Two mothers looked for organic food “I think like a healthy thing [organic] and also when you’re a working mom you have a bit of guilt sending your child off for part of the day. I think part of that made me feel better” – Claims processor, mother of 2
Mothers

RICE CEREAL

All but one mother explained they fed or were planning on feeding infant rice cereal.

It would make their baby full, “sleep longer”, “slow them down” – 2 mothers

“It’s the traditional thing.” – restaurant manager, first time mom.

One mother did not plan on rice cereal over concerns with arsenic or would cause allergies – Physician, mother of 3
Healthcare Providers

UNDERSTANDING OF GUIDELINES IS LIMITED

AAP guidelines for breastfeeding were recited by all, but “infant nutrition” was unknown.

“I couldn’t really find any specific guidelines” – NP, NICU

It has become hard to standardize them due to the constant changes being made. – Physician, CHOP Childcare Network

PHYSICIANS ARE REACTIVE TO FEEDING, NOT PROACTIVE

“It’s more common that they’ve already started something on their own and then we just try to educate about how to introduce it and what to cover” – Pediatrician, Nemours Pediatrics

“Moms have already started doing it even without getting the counseling” – Pediatric Attending, Nemours
Healthcare Providers

A NEED FOR NUTRITION EDUCATION

“We sometimes leave it to the patient or the consumer to decide what’s good for them and not throw out your own, ‘this is what I would eat at my house’. The truth is people do need education around it and the lack of nutrition education on the family side is huge” – Pediatrician, CHOP Childcare Network

RICE CEREAL

All of the physicians would recommend rice cereal as part of an infants first foods, some were specific to say iron fortified.

“It’s an easy first food” and “harmless”.

Three physicians were not sure why it was recommended, but that it was the common practice.
At the policy level, there is an understanding that the earlier we intervene, the greater chance we have for long term health impacts.

“People are starting to become aware of the importance of intervening at a younger age is because we do see those longer term positive health outcomes when a kid has a good experience 0 to 2, and positive in terms that they live longer, they make more money, they’re able to graduate from high school, they’re able to get and secure a good job, etc...I think that has been a good thing that we’ve been able to show that these longer term outcomes really are good for the economy, they’re good for the populous, they’re good for your community” – Policy expert, Food, Nutrition & Policy Consultants
Policy

MORE EVIDENCED BASED RESEARCH IS NEEDED TO CREATE GUIDANCE

Without evidenced based guidance, many organizations and groups can draw different conclusions about what is a best practice.

“Information Overload” – Policy Expert, AAP

Expert actively looks through guidelines for discrepancies, because it happens so often.

“For the 0-2 [age range] guidelines...we had been missing by not developing a set of cohesive recommendations for health care professionals to follow”” – Policy Expert, FNCP
### INFANT NUTRITION – CURRENTLY A MODERATE PRIORITY

A small part of the many things that could impact an infant's health.

Nutrition guidance could not be recalled, but initiatives such as Safe Sleep were recognized.

Many perspectives on a specific problem.

### RICE CEREAL

Neutral or negative associations with rice cereal.

"An example of a general overarching feeding practice that I know is not helpful or healthy" Policy Expert, FNCP.

AAP expert has seen a movement away from rice cereal and is aware of the potential arsenic exposure.
Discussion
Lack of Guidance Burdens Mothers

Physicians are not equipped to council mothers
  ◦ No infant nutrition for older generation physicians
  ◦ No solid guidance

Mothers expressed a feeling that physicians expected them to do their own research

Some providers did not council women to avoid overwhelming them with options.

If there is counseling on foods, it is reactive, not proactive
  ◦ Mothers are heavily reliant on subjective norms, how their mothers fed them, what their friends are doing etc.
Rice Cereal

**Policy**
- Negative or neutral associations.
- “An example of a general overarching feeding practice that I know is not helpful”
- Movement away from rice cereal, possible concerns with arsenic

**Physicians**
- All physicians recommended rice cereal
- “Easy first food”, “harmless”, iron rich, convenient for mom
- Few were not aware of why they recommended it

**Mothers**
- 4 of 5 mothers will feed or fed rice cereal
- “Traditional food”, baby will “sleep longer”, “slow her down a bit”
Theory of Reasoned Action – Attitudes/Beliefs and Subjective Norms Shape Infant Feeding Practices and Recommendations

Lack of evidence based data results in vague guidance
   ◦ No strong incentive for physicians to follow

No clear, consistent message
   ◦ Ability to influence mothers to make healthy choices is minimal

Without proper information dissemination:
   ◦ Mothers must pull from their subjective norms
     ◦ May or may not align with the healthiest behaviors
     ◦ Behaviors that have been deemed unacceptable by the medical community still perpetuates through generations of families relying on each other
   ◦ Mothers must pull from their own attitudes and beliefs
     ◦ Shaped by non-clinical experiences
     ◦ Media and personal research

Mothers are developing their own plan for feeding and physicians are waiting for the behavior to happen before intervening. They are removing themselves from being influential in behavior outcome.
Unexpected Themes
Convenience: Key Driver for Providers and Mothers

Both pediatricians and mothers suggested convenience as a factor in how they recommended feeding and practiced it.

Convenience was discussed more often than nutrition and health when discussing food.

Two mothers attempted to make their own food but was too “burdensome”.

Physicians discussed recommending feeding practices that will be “more convenient for mom” so they feel less overwhelmed.
Providers and Mothers: A Complex Relationship

"TRYING TO FIGURE OUT IF THEY’RE SAYING THE ANSWER THAT THEY WANT THE DOCTOR TO HEAR AS OPPOSED TO WHAT’S ACTUALLY HAPPENING" – PROVIDER, CHOP CHILDCARE NETWORK

The need to please or not disappoint the physician.

Physicians refrained from personal stories, did not want to seem like they were pressuring if the mother wanted to take a different approach

“"I DIDN’T WANT TO INSULT THEIR INTELLIGENCE OR WHATEVER BUT THEY ASSUME EVERYONE KNOWS BECAUSE THEY KNOW” – MOTHER, ACTIVE DUTY

Mothers refrained from speaking up about possible issues or questions.

Mothers believed that physicians were taking a soft approach to guidance.
Study Limitations

Small sample size

Four of five physicians were practicing in academic hospitals or clinics

Self reported data
  ◦ Selective memory
Next Steps
Future Research Opportunity & Recommendations

Increased sample size and demographics could provide a greater variation in response
- Focus on rural vs. urban populations
- Assessing different cultures
- Focus on socio-economic status
- Breastfed infants vs. formula fed infants

Research if the infant population does impact the obesity epidemic, as it has been overlooked in previous studies and guidance.

Understand why the United States continues to recommend infant rice cereal over other industrialized nations and the impact on health outcomes.

Enhance the current communication gaps between providers and patients.
- Engaging providers early to build trust
Thank you

QUESTIONS?