Cow’s Milk Protein Allergy

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Question 1

A 18 day old baby girl has been brought to you with complaints of passing frank blood in stool (approx. 5ml) on at least 4 separate occasions since birth. She was delivered by normal (vaginal) delivery, birth weight 2.7 kg, first child of parents. She has been actively feeding, alert and has no frequent vomiting. She has been on breast feeds as well as top feeds (lactogen-1) since birth.

How will you approach this child and manage?
A 9 month old boy weighing 6.2 kg has been having increased stool frequency and frequent regurgitation of feeds for the past 2 months. His birth weight was 3 kg. He was exclusively breast-fed till 6 months of age and subsequently is on a combination of breast feeds, single toned (Mother Dairy) milk and semisolid weaning foods. He has not responded to anti-reflux measures.

What does he have?
What would you like to do?
Question 3

The infant boy is now 10 months old, he has received over the past 4 weeks, MCT containing infant formula for 10 days followed by a soy formula for the remaining period. His problem remains unresolved and his weight is 6.4 kg.

What will you do now?
Cow’s Milk Protein Allergy (CPMA)

Definition: “It is an allergy to both casein and whey protein components of animal milk protein which may manifest with Gastrointestinal symptoms only or symptoms involving other Organ systems of the body (respiratory and skin) in addition to the gastrointestinal tract. Most cases are IGE-mediated (ATOPIC), some may be IGA - mediated.”

Cow’s Milk Protein Intolerance (CMPI)

Definition: “It is intolerance to animal milk protein which manifests with symptoms identical to cow’s milk protein Allergy but the underlying mechanisms are non – immunological.”
<table>
<thead>
<tr>
<th>CMPA</th>
<th>CMPI</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Always immunologically mediated</td>
<td>1. Involves, non-immunological Mechanisms</td>
</tr>
<tr>
<td>2. Involvement of organ systems other than GIT well described</td>
<td>2. Involvement of organ systems other than GIT unusual</td>
</tr>
<tr>
<td>4. Reintroduction of animal milk after 2 yrs of age should follow</td>
<td>4. Reintroduction of animal milk after 2 years of age can be</td>
</tr>
<tr>
<td>a systematic approach of desensitization exposing child to very</td>
<td>achieved rapidly without a systematic desensitization process</td>
</tr>
<tr>
<td>gradually increasing quantities of animal milk</td>
<td></td>
</tr>
</tbody>
</table>
Decoding Cows Milk Protein Allergy (CMPA)
Breast feeding is the best

No interest in any brand promotion
Layout of presentation

CMPA

Case scenarios – Allergy and Intolerance

Carry home message
Feeding Practices of Infants Under Six Months

Overall, slightly less than half of children under six months of age are exclusively breastfed.

In India, the introduction of liquids, solid or semi-solid foods often takes place before the recommended age of 6 months.

Source
Nutrition in India. National Family Health Survey- 3, 2005-06
Bovine milk usage and feeding practices for infants in India. Indian J Public Health 2012;56:75-81
Feeding Practice - Alternatives

Types of milk purchased for infant feeding (%)

- Loose cow milk: 28%
- Loose buffalo milk: 28%
- Full cream packet milk: 15%
- Skimmed milk: 14%
- Double toned packet milk: 8%
- Token milk: 6%
- Single toned packet milk: 1%

Source
Bovine milk usage and feeding practices for infants in India. Indian J Public Health 2012;56:75-81
Feeding practice – regional differences

<table>
<thead>
<tr>
<th>Region</th>
<th>Preferred milk for feeding</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>Loose buffalo milk (49%)</td>
</tr>
<tr>
<td>East</td>
<td>Cow's milk (65%)</td>
</tr>
<tr>
<td>West</td>
<td>Full cream packet milk (27%)</td>
</tr>
<tr>
<td>South</td>
<td>Cow's milk (27%)</td>
</tr>
</tbody>
</table>

The milk is modified in majority of cases (81%) before fed.

Modification was often done with sugar (85%), followed by water (49%), biscuits, fennel seeds, cardamom or infant cereals before feeding.

On an average 61% of the infants are given bovine milk.

Source
Bovine milk usage and feeding practices for infants in India. Indian J Public Health 2012;56:75-81
Cow’s milk usage in infants - the controversy
Cow’s milk usage in infants - the controversy

The Government of India recommends that children should be exclusively breastfed for the first 6 months of life and that children should be given appropriate and adequate complementary feeding in addition to continued breastfeeding from 6 months of age.

The American Academy of Paediatrics (AAP) recommends that whole cow’s milk and low iron formulas not be used during the first year of life.

Source:
Ministry of Women and Child Development, 2006
Cow’s milk usage in infants- the controversy

Iron Deficiency Anemia (IDA)
Renal Solute Load (RSL)
Risk of Diabetes Mellitus (DM)
Allergy and others
Cow’s Milk and Iron Deficiency Anaemia (IDA)

A strong correlation between whole cow’s milk use and development of IDA

ESPGHAN and AAP recommend that it is best to delay the introduction of whole cow’s milk until the infant is one year old.

Some of the important reasons are;

• Very low content of iron in cow’s milk (less than 0.3mg/L to 1 mg/L)
• Reduced bioavailability because of non-heme nature and higher calcium and phosphorus
• Gastrointestinal bleeding (the risk for IDA increases when about 500–1000 ml of whole cow’s milk is consumed daily)
• Bovine milk proteins are potent inhibitors of iron absorption.

Source
Alexander KC Leung et al. Whole cow’s milk in infancy. Paediatr Child Health Vol 8 No 7 September 2003
Cow’s Milk and Renal Effects

<table>
<thead>
<tr>
<th>Approximate values per 100ml</th>
<th>Cow milk</th>
<th>Human milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sodium</td>
<td>mg</td>
<td>73.00</td>
</tr>
<tr>
<td>Potassium</td>
<td>mg</td>
<td>140.00</td>
</tr>
<tr>
<td>Chloride</td>
<td>mg</td>
<td>103</td>
</tr>
<tr>
<td>Calcium</td>
<td>mg</td>
<td>120.00</td>
</tr>
<tr>
<td>Phosphorous</td>
<td>mg</td>
<td>90.00</td>
</tr>
</tbody>
</table>

Feeding infants with whole cow’s milk narrows the margin of safety in situations that may lead to dehydration, such as when water intake is reduced (eg, vomiting) or water loss is increased (eg, diarrhea, hot environment), whole cow’s milk may not supply enough free water. Dehydration may result unless additional water is offered.

Source
Whole cow’s milk in infancy. Paediatr Child Health Vol 8 No 7 September 2003
Nutritive value of Indian foods. NIN, ICMR; 2011
Cow’s Milk and Risk of Diabetes

An association between early exposure to cow’s milk proteins and risk for type 1 diabetes mellitus has been reported.

Cow’s milk proteins elicits antibody formation to insulin in some children. Bovine serum albumin may provoke an immunological response in genetically susceptible individuals, which then cross reacts with a beta-cell surface protein.

Destruction of beta cells may lead to the development of diabetes mellitus.

The AAP recommends that in families with a strong history of insulin-dependent diabetes mellitus, breastfeeding and avoidance of commercially available cow’s milk and products containing intact cow’s milk proteins during the first year of life are strongly encouraged.

Source
Whole cow’s milk in infancy. Paediatr Child Health Vol 8 No 7 September 2003
Cow’s Milk Exposure and Type I Diabetes Mellitus. Diabetes Care, Volume 17, Number 1, January 1994
Cow’s milk and allergy

Although controversial, it is believed that increased intestinal permeability may contribute to the high incidence of cow’s milk protein allergy.

CMPA is suspected clinically in 1%-17% of infants, while most estimates for the prevalence of CMPA vary from region to region and has been found to be in 2% to 7.5% of infants.

The major allergens from cow’s milk have been found to be β-lactoglobulin, α-lactalbumin and caseins.

Treatment of infant formulas by methods such as heating, high pressure treatment and proteolysis offers an efficient way to destroy allergenic epitopes and to reduce their allergenicity.

Source

*Whole cow’s milk in infancy. Paediatr Child Health Vol 8 No 7 September 2003
Cow’s milk allergy in children. CME JANUARY 2011 Vol.29 No.1
Let us discuss in details on Cow’s Milk Protein Allergy
Adverse Food Reaction

Immune mediated
Food allergy

Non-immune mediated
Primary food intolerance

J Allergy Clin Immunol Dec 2010
Adverse Food Reaction

Immune mediated
Food allergy

Non-IgE mediated
FP induced enteropathy

Mixed IgE and non-IgE mediated
Eosinophilic esophagitis

Cell mediated
Allergic contact dermatitis

Non-immune mediated
Primary food intolerance

IgE mediated
Acute urticaria

Mechanism

Example

J Allergy Clin Immunol Dec 2010
Adverse Food Reaction

Immune mediated Food allergy

Metabolic
Lactose intolerance

Pharmacologic
Caffeine - hyperactivity

Food factor
Toxin, Infectious organisms

Non-immune mediated Primary food intolerance

Psychologic
Food phobia

J Allergy Clin ImmunoAl Dec 2010
Common Food Allergens

Big Eight Allergens

- Egg
- Milk
- Fish
- Soy
- Peanuts
- Tree Nuts
- Shellfish
- Wheat
Food allergy - prevalence (meta analysis of 51 studies)

More than 170 foods have been reported to cause IgE mediated reactions

<table>
<thead>
<tr>
<th>Diagnostic criteria</th>
<th>Overall Prevalence</th>
<th>Peanut</th>
<th>Milk</th>
<th>Egg</th>
<th>Fish</th>
<th>Crustacean Fish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self –reported Symptoms: Children</td>
<td>12%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self –reported Symptoms: Adults</td>
<td>13%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self –reported Symptoms: All ages</td>
<td></td>
<td>0.6%</td>
<td>3%*</td>
<td>1%</td>
<td>0.6%</td>
<td>1.2%</td>
</tr>
<tr>
<td>Symptoms plus SPT or serum IgE: All ages</td>
<td>3%</td>
<td>0.75%</td>
<td>0.6%</td>
<td>0.9%</td>
<td>0.3%</td>
<td>0.6%</td>
</tr>
<tr>
<td>Food challenge: All ages</td>
<td>3%</td>
<td>NE</td>
<td>0.9%</td>
<td>0.3%</td>
<td>0.2%</td>
<td>NE</td>
</tr>
</tbody>
</table>

No prevalence data of food allergy in India

NE- Not estimated; SPT- Skin prick test
Greater prevalence in children than adults, not specifically estimated but it appears to be about 6% to 7% in children and 1% to 2% in adults

_J Allergy Clin Immunol_ 2007 Sep; 120(3):638-46
Every food has its own story….

Cow’s milk
Hen’s egg
Peanuts, fish, seafood

Earlier the age of intolerance, more is the chances of remission
### Age at Onset

<table>
<thead>
<tr>
<th>Age</th>
<th>Food</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1yr</td>
<td>Milk, Egg</td>
</tr>
<tr>
<td>1-2yrs</td>
<td>Fish</td>
</tr>
<tr>
<td>&gt;2yrs</td>
<td>Fruits, Legumes, Vegetables</td>
</tr>
<tr>
<td>&gt;3yrs</td>
<td>Pollen related cross reactivity</td>
</tr>
</tbody>
</table>

### CMPA in India (1993)

#### Etiology of malabsorption in India

<table>
<thead>
<tr>
<th>Etiology</th>
<th>Age &lt; 2 years</th>
<th>Age &gt; 2 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persistent diarrhea</td>
<td>73 %</td>
<td>0 %</td>
</tr>
<tr>
<td>CMPI</td>
<td>13 %</td>
<td>0 %</td>
</tr>
<tr>
<td>Celiac disease</td>
<td>5 %</td>
<td>43 %</td>
</tr>
<tr>
<td>Parasites</td>
<td>3 %</td>
<td>15 %</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>0 %</td>
<td>9 %</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>0 %</td>
<td>24 %</td>
</tr>
</tbody>
</table>

*Indian J. Gastroenterol. 1993*
Causes of chronic diarrhoea <3 years (n=164)

- CMPA: 39%
- Celiac: 48%
- GIARDIA: 4%
- Nonspecific: 4%
- IBD: 5%

Journal of Gastroenterology and Hepatology 2009
### Composition of major protein in human and cows milk

<table>
<thead>
<tr>
<th>Protein</th>
<th>Human milk (mg/ml)</th>
<th>Cows Milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>alpha Lactalbumin</td>
<td>2.2</td>
<td>1.2</td>
</tr>
<tr>
<td>alpha s1 casien</td>
<td>0</td>
<td>11.6</td>
</tr>
<tr>
<td>alpha s2 casien</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>b cassien</td>
<td>2.2</td>
<td>9.6</td>
</tr>
<tr>
<td>k cassien</td>
<td>0.4</td>
<td>3.6</td>
</tr>
<tr>
<td>g cassien</td>
<td>0</td>
<td>1.6</td>
</tr>
<tr>
<td>Immunlglobulin</td>
<td>0.8</td>
<td>0.6</td>
</tr>
<tr>
<td>Lactoferrin</td>
<td>1.4</td>
<td>0.3</td>
</tr>
<tr>
<td>b globulin</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Lysosome</td>
<td>0.5</td>
<td>trace</td>
</tr>
<tr>
<td>Albumin</td>
<td>0.4</td>
<td>0.4</td>
</tr>
<tr>
<td>Other</td>
<td>0.8</td>
<td>0.6</td>
</tr>
</tbody>
</table>
Features of CMPA

Cows milk is composed of variety of proteins - Casein (80 %): αs1-, αs2-, β- and κ-caseins, Whey (20 %): α lactalbumin, β lactoglobulin and others

β lactoglobulin being considered as the most important cows milk allergen

Cross reactivity between antigens of different bovine milk
<table>
<thead>
<tr>
<th>Immediate Reactions</th>
<th>Late Reactions</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Anaphylaxis</td>
<td>• Atopic dermatitis</td>
</tr>
<tr>
<td>• Acute urticaria</td>
<td>• Chronic diarrhea, stool blood, iron deficiency anaemia, gastroesophageal reflux disease, constipation, chronic vomiting, infantile colic</td>
</tr>
<tr>
<td>• Acute angioedema</td>
<td>• Poor growth (food refusal)</td>
</tr>
<tr>
<td>• Wheezing</td>
<td>• Protein-losing with hyperalbuminemia</td>
</tr>
<tr>
<td>• Rhinitis</td>
<td>• Enterocolitis syndrome</td>
</tr>
<tr>
<td>• Dry cough</td>
<td>• Eosinophilic oesophagogastrointeropathy confirmed by biopsy</td>
</tr>
<tr>
<td>• Vomitting</td>
<td></td>
</tr>
<tr>
<td>• Laryngeal edema</td>
<td></td>
</tr>
<tr>
<td>• Acute asthma with severe respiratory distress</td>
<td></td>
</tr>
</tbody>
</table>
15–21% of children with suggested or proven GERD and CMPA suffer from both conditions

Int Semin Paediatr Gastroenterol Nutr 2002;11:1–7
CMPA variants

10% of children with Colic and CMPA suffer from both conditions

Colic

CMPA

10%

Int Semin Paediatr Gastroenterol Nutr 2002;11:1–7
Food allergy - Investigations

None of the test prove or disprove diagnosis of CMPA

Elimination diet and re challenge remain the gold standard

Immunocap (IgE against Milk protein) and Skin Prick test may be needed in certain circumstances under specialist
CMPA – What to Avoid

Milk and milk products

Curd, Butter, butter, milk, Ghee, Biscuits, Breads, sweets, etc.
Dairy free diet for child and mother (if being breastfed) for 2-4 weeks

If improvement - rechallenge with cows milk after 1-3 months

If symptoms recur, confirms diagnosis. Rechallenge after 1 year of age or after 6 months of the reaction
Case Scenario 1

3 month old infant c/o visible specks of blood with mucus for past 7 days

Exclusively breast fed, not sick, growing well

Stool culture – E coli, treated with 2 courses of antibiotics; oral f/b parenteral

USG – normal. No intussusception

Blood test – Hb 10.5, Platelet 3.5 lac, INR 1.1, APTT 32 (Control 30)
Case Scenario 1

Histology (Rectal biopsy)
Increased eosinophils > 6/hpf

Sigmoidoscopy
aphthous ulcerations
Case Scenario 1

Diagnosis: Allergic Proctosigmoiditis
What dietary advise ?

Stop Dairy products in mother; Continue breastfeeding !
Wean with Dairy free diet
Calcium supplements for mother
A breastfed baby can develop CMPA due to secretion of bovine protein (beta lactoglobulin) through breast milk when the mother is ingesting bovine milk.

Incidence - 0.5 % of exclusively breastfed infants may develop CMPA as opposed to 3 % otherwise. Most of these are mild to moderate.

CMP present in breast milk is 100,000 times lower than that in cow’s milk.

Treatment includes stoppage of dairy products in mother.

J. Pediatr. 1982
Case Scenario 2

6 month old infant with recurrent vomiting since past 1 month

Treated with Domperdione, Lansoprazole & Ondansetron by 2 doctors, no response

Developed one episode of hematemesis Hb 6.8, received Packed RBC
Case Scenario 2

UGI Endoscopy – Hemorrhagic Gastritis

Histology - Increased Eosinophils

Diagnosis: CMPA
Case Scenario 2

Infant was started on dairy free diet
Repeat endoscopy after 1 month – normal
No further vomiting or GI bleed
Milk challenge after 6 months, no reaction, now tolerating dairy products
Case Scenario 3

2 yrs old girl child
Post weaning intolerance to cow’s milk
Not able to tolerate milk products
2/3 episodes of post exposure Urticarial rash
Open food challenge is consistent with diagnosis of Food allergy (Grade C evidence)
After a physical examination
A drop of the formula is put on the lips
If no reaction occurs after 15 min, the formula is given orally and the dose is increased stepwise (0.5, 1.0, 3.0, 10, 30, 50 to 100 ml) every 30 min
Child should receive at least 250 ml of cow’s milk-based formula each day for the next week and the parents told to observe the child for late reactions
What next?

Eliminate cows milk from diet

Consider alternative
CMPA – Options

Breastfeeding/ Relactation

Extensively hydrolyzed formula/Amino acid based formula

Soya Milk

Non dairy food
CMPA – Options in India

Breastfeeding/ Relactation

Soya Milk

Non dairy food
Non Dairy Food

Chicken feeds: Comminuted chicken available in predigested form for use in CMPA

Rice: In infants older than 4 months (sometimes in 2 months old)
<table>
<thead>
<tr>
<th>Protein Structure in Infant Formulas</th>
<th>Type of Protein</th>
<th>Formulas Available*</th>
<th>Hypo-allergenict</th>
<th>Contains Milk Proteins (Whey or Casein)</th>
<th>Protein Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOST ALLERGENIC</td>
<td>Dairy and soy-based</td>
<td>Enfamil Lipil™</td>
<td>No</td>
<td>Yes</td>
<td>Complete protein chains that can trigger an allergic reaction.</td>
</tr>
<tr>
<td></td>
<td>Partially Hydrolyzed</td>
<td>Gentlease™, Good Start™</td>
<td>No</td>
<td>Yes</td>
<td>Protein chains are partially broken down into pieces.</td>
</tr>
<tr>
<td></td>
<td>Extensively Hydrolyzed</td>
<td>Nutramigen™, Alimentum™, Pregestimil™</td>
<td>Yes</td>
<td>Yes</td>
<td>Protein chains are broken down into pieces. Although these formulas are called hypoallergenic, they can still trigger an allergic reaction.</td>
</tr>
<tr>
<td>NON-ALLERGENIC</td>
<td>Amino acid-based</td>
<td>Neocate® Infant (100% amino acid-based)</td>
<td>Yes</td>
<td>No</td>
<td>No intact protein chains, based on individual, non-allergenic amino acids. No peptide links to trigger an allergic reaction.</td>
</tr>
</tbody>
</table>

*Examples – not a complete list  
1Mead Johnson Nutrition  
2Abbott Nutrition  
3Nestle Nutrition
Soy formula recommended for

- Term infants with IgE mediated allergy to cow milk
- Term infants with galactosemia.
- Term infants with transient lactase deficiency

Note: neither AAP 2008 statement nor 2014 handbook put age limit
Concern Regarding Growth

AAP: “isolated soy protein-based formulas may be used to provide nutrition for normal growth” *Pediatrics* 2008; 121:1062

ESPGHAN: “soy protein formulae can be used for feeding term infants but have no nutritional advantage over cows-milk protein formulae” *JPGN* 2006;42:352

Soy formulas support growth *equivalent* to that of breastfed and cow milk-based formula fed infants. Bone mineralization is similar in full-term infants fed soy and cow milk-based formulas."
Reproductive and Endocrine Outcomes

No Differences for:

<table>
<thead>
<tr>
<th>Missed periods</th>
<th>Height</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spotting</td>
<td>Weight</td>
</tr>
<tr>
<td>Cramps</td>
<td>Age of sexual maturation</td>
</tr>
<tr>
<td>Breast tenderness</td>
<td>Menstrual cycle length</td>
</tr>
<tr>
<td>Pregnancy</td>
<td>Regularity of menses</td>
</tr>
<tr>
<td>Pregnancy outcomes</td>
<td>Menstrual flow</td>
</tr>
</tbody>
</table>

Bottom line

- Soy formula fed subjects no different from cow’s milk formula fed subjects on almost all outcomes evaluated
- Given >30 variables
- Findings were “reassuring about the safety of soy infant formula”

Strom et al., JAMA 2001;286:807-814
Indications for Soy Formula: What do the doctors really do?

United Kingdom: direct count of feeding and diagnoses
National database query for feeding prescriptions

- Infants < 12 months, and
- Diagnosis of cow milk allergy by GP

Overall, 60% given soy formula, 18% eHF
For infants < 6 months, 76% soy, 21% eHF
5% of soy fed infants switched to another formula
29% of eHF infants switched to another formula

Case Scenario 4

2 month old infant c/o diarrhea (8-10 stools/day) – 5 days, no blood, perianal excoriation +

Exclusively breast fed

Weight gain acceptable to doctor

Stool examination – reducing substance positive!

What dietary advise?

Green, Orange to Dark Brick Red
Stool and urinary sugars in normal neonates

R. COUNAHAN and J. WALKER-SMITH

From Queen Elizabeth Hospital for Children and the Mother’s Salvation Army Hospital, London

Stool reducing substance  > 0.5 gm% (++ – 32%)
Stool pH < 5 – 10%, < 6 - 25%

(Trace – 100 mg%, 1 + - 250 mg%, 2 + - 500 mg%, 4+ - > 1gm%)
Case Scenario 4

Diagnosis: Pseudo diarrhea/Fore milk diarrhea

Treat lactose intolerance only if above associated with severe diarrhea

Continue breastfeeding, Give more of hind milk
Lactose intolerance

**Congenital lactase deficiency**
Very rare, autosomal recessive, presents at birth, common in Finland

**Primary lactase deficiency**
Affects adults, genetic, most common

**Secondary lactase deficiency**
Caused by injury to small intestine, usually in infancy
<table>
<thead>
<tr>
<th></th>
<th>Cows milk allergy</th>
<th>Lactose intolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of adverse reaction</strong></td>
<td>Allergy – immunological</td>
<td>Intolerance – non immunological</td>
</tr>
<tr>
<td><strong>Pathological molecule</strong></td>
<td>Bovine milk protein</td>
<td>Lactose - carbohydrate</td>
</tr>
<tr>
<td><strong>Organ involvement</strong></td>
<td>GIT, Skin, Respiratory</td>
<td>GIT</td>
</tr>
<tr>
<td><strong>Common GIT symptom</strong></td>
<td>Vomiting, Colic, small or large bowel diarrhea, GI Bleed</td>
<td>Small bowel diarrhea, Colic, flatulence, perianal excoriation</td>
</tr>
<tr>
<td><strong>Age group affected</strong></td>
<td>Infancy and toddler</td>
<td>All age group</td>
</tr>
<tr>
<td><strong>Treatment</strong></td>
<td>Stoppage of all dairy products, change to non dairy protein or hydrolyzed formula</td>
<td>Reduction of lactose, can continue dairy protein</td>
</tr>
<tr>
<td><strong>Result of treatment</strong></td>
<td>Qualitative – all or none phenomenon</td>
<td>Quantitative – response as per reduction of lactose</td>
</tr>
</tbody>
</table>
CMPA in Breast Fed Infant-Principles of Management

1. Breast feeding should be promoted for the primary prevention of allergy

2. Allergen avoidance
In Infants with Atopic Dermatitis

Younger the infant and/or the more severe the atopic dermatitis, the stronger the association

Sensitized to

4 times

8 times

Younger the infant and/or the more severe the atopic dermatitis, the stronger the association

First Line Elimination Diet

- Milk
- Egg
- Peanuts
Second Line Elimination Diet

Excluding fish, wheat and other gluten-containing grain products

Demanding for the mother → risk of consuming unbalanced diet

Require the advice of an experienced dietician

If the mother has a certain suspicion on any other food elimination diet should be adapted accordingly
Diagnostic Approach and Management of Cow’s-Milk Protein Allergy in Infants and Children: ESPGHAN GI Committee Practical Guidelines

*S. Koletzko, †B. Niggemann, ‡A. Arato, §J.A. Dias, ‖R. Heuschkel, ††S. Husby, #M.L. Mearin, **A. Papadopoulou, †††F.M. Ruemmele, ‡‡A. Staiano, §§M.G. Schäppi, and ‖‖‖Y. Vandenplas
History, physical examination +/- laboratory tests

Diagnostic elimination diet
- Early and late reactions (e.g. vomiting, atopic eczema): 1 - 2 weeks
- Gastrointestinal symptoms (e.g. diarrhea, constipation): 2 - 4 weeks
  dairy free diet for mother if exclusively breast fed

No improvement of clinical symptoms
Improve of the clinical symptoms

Standardized oral challenge with CMP (open, single and/or double blind) introduce dairy into mothers diet for exclusive breast fed infants

Negative
Positive

No CMP elimination diet
Therapeutic elimination diet

Anaphylaxis or clear immediate type* reaction

CMP elimination and test for specific IgE
Spec. IgE negative
Spec. IgE positive

Adapted from ESPGHAN position paper; JPGN 2012;55: 221–229
Food Allergy – Safety Measure
CMPA may present with gastrointestinal respiratory or skin manifestation.

First manifestation is generally in infancy.

Recurrent vomiting, GI bleeding, diarrhea are common GI manifestations.
Conclusion: Food Allergy… Myth or reality?

... A Reality... surrounded with lot’s of myth

Ignorance → Belief → Overdiagnosis

Scientific data

Nonscientific data

I have FOOD ALLERGIES
Don't feed me!
THANK YOU!!