

Diagnosing and Managing Cow's Milk Protein Allergy (CMPA) in Infants



Speaker:

Cathy Laarman, RD, CSP
NICU Dietitian



Disclosure

- Support for this program is provided by Prolacta Bioscience™
- The slides were developed by the speaker with input from the Nutrition Advisory Committee (NAC)



Objectives

- Identify the signs and symptoms and types of Cow's Milk Protein Allergy (CMPA)
- Identify the guidelines for diagnosing CMPA
- Implement the appropriate nutrition intervention for an infant with CMPA



Cow's Milk Protein Allergy

Cow's milk protein allergy (CMPA) is the leading cause of food allergy afflicting infants and children under 3 years of age

Boyce JA, Assa'ad A, Burks WA, et al. J Allergy Clin Immunol 2010;126:S1-58
Sicherer SH. J Allergy Clin Immunol 2011;127:594-602



Cow's Milk Protein Allergy

Among the five common food allergens, cow's milk protein (CMP) is the most severe in infants and occurs most frequently within the first year of life.

Sampson HA. Food allergy J Allergy Clin Immunol. 1999;103:717-728.
Boyce JA, Assa'ad A, Burks WA, et al. J Allergy Clin Immunol 2010;126:S1-58



Screening

No screening method was found to be effective in identifying a child at risk for an allergy.

Chamlin SL, Kaulback K, Mancini AJ. Ped Derm. 2009;26(3):247-56.



Discrepancy in Prevalence of CMPA

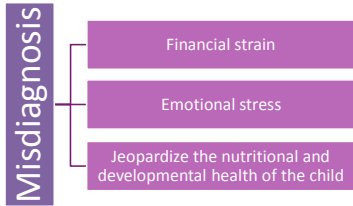
Prevalence in studies of diagnoses:

	Self Reported	Food Challenge	Skin Prick Test & Specific IgE Antibody Test
Prevalence	1.2 - 17%	0-3%	2-9%

R.J. Rona, et al. J. Allergy Clin Immunol. 120(2007) 638-646.



Diagnosis





Diagnosis

- Accurate history
- Thorough examination
- Important:
 - What was ingested?
 - When was it ingested?
 - Symptoms?



Food Allergy Reaction Types

- IgE-mediated
- Non-IgE-mediated
- Mixed



IgE-mediated CMPA

- Easily diagnosed
- Rapid onset
 - Minutes to 2 hours
- Can involve multiple systems
 - Skin
 - Respiratory
 - Cardiovascular
 - Gastrointestinal



IgE-mediated CMPA

Food allergies in children are mostly IgE-mediated

World Allergy Organization (WAO) Diagnosis and Rationale for Action against Cow's Milk Allergy (DRACMA) Guidelines –2010



Skin Symptoms

- Urticaria (hives)
 - 20% seen d/t food allergies
- Flushing
- Diaphoresis
- Angioedema
 - Puffy eyes, lips, raised red-blotchy areas



Respiratory Symptoms

- Occur less frequently in food allergy reactions
 - Combined with other organ system will indicate more severe disease manifestationJames JM. *Immunol Allergy Clin N Am.* 2001;21:653-667
- Asthma
- Environmental allergies
- Sneezing, rhinorrhea, nasal congestion, oral pruritus
- Hoarseness, stridor, laryngeal edema
- Dyspnea, tachypnea, wheezing, cough, cyanosis



GI Symptoms

- Develop in minutes to two hours after ingestion:
- Swelling of lip, tongue and palate
 - Nausea
 - Vomiting
 - Diarrhea
 - Abdominal cramping
 - Occasionally bloody stools



Cardiovascular Symptoms

- Anaphylactic Shock
- Rare



Non-IgE-mediated CMPA

No circulating cow's milk protein-specific IgE present in the blood



Non-IgE-mediated CMPA

- Usually delayed reactions
- Symptoms (mostly GI-related)
 - Nausea
 - Bloating
 - Intestinal discomfort
 - Diarrhea
 - Similar to lactose intolerance symptoms



Diagnostic Tests

- Serum specific-IgE – only if suspected IgE-mediated CMPA.
- Total IgE is not necessary
- Specific IgG antibodies or IgG subclass antibodies against CMP is not recommended

Boyce JA, Assa'ad A, Burks WA, et al. J Allergy Clin Immunol 2010;126:S1-58)



Diagnostic Tests

- Skin Prick Test (SPT) – can have a false positive and does not clearly prove an IgE-mediated allergy.
- Atopy patch test – used to diagnose non-IgE-mediated CMPA after ingestion

S.H. Sicherer, H.A. Sampson, J. Allergy Clin. Immunol. 117(2006)470-475



Diagnostic Tests

Double-blind placebo-controlled food challenge (DBPCFC)



Gold standard in diagnosing CMPA



Diagnostic Tests

A hospital setting would not be conducive to an oral food challenge.



Diagnostic Tests



Koletzko S, et al. JPGN 2012;55:221-29.

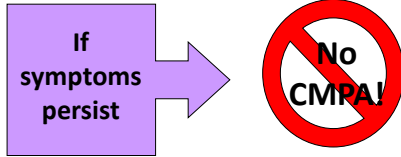


Diagnostic Elimination of Cow's Milk Protein (CMP)

- Be as short as possible
 - 3-5 days: immediate clinical reactions
 - 1-2 weeks: delayed clinical reactions
 - 2-4 weeks: GI reactions



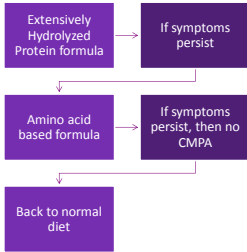
Diagnostic Elimination of CMP





Diagnostic Elimination of CMP

GI Symptoms:





Diagnostic Elimination of CMP

- If Breastfeeding:
 - Continue to encourage
 - Mother to follow strict milk free diet

"The level of cow's milk protein present in breast milk is 100,000 times lower than that in cow's milk."

Host, A et al. Clin Exp Allergy. 1990;20:383-7.



Diagnostic Elimination of CMP

- Comprehensive diet instruction by Registered Dietitian on:
 - List of milk products to avoid
 - List of milk derivative ingredients
 - Process for preventing cross contamination
 - Take 1000 mg of Calcium daily and 400 IU of Vitamin D daily

Ludman, S., et al. BMJ 2013;347:f5424



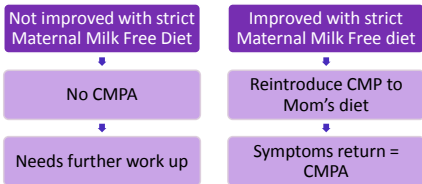
Diagnostic Elimination of CMP

Length of Time for Elimination Diet

Immediate Reaction	Delayed Reaction
3-6 days	Up to 14 days



Diagnostic Elimination of CMP





Options for Formula Feeding

Soy protein based formula is not recommended for prevention or therapy of CMPA.

10-35% of infants with CMPA will react to soy protein as well.

Klemola, T et al. J Pediatr. 2002;140:219-24.



Options for Formula Feeding

Partially hydrolyzed formulas are not appropriate for children with food allergies.



Options for Formula Feeding

- Extensively Hydrolyzed formulas
- Amino Acid based formulas
- Extensively Hydrolyzed Rice formula



Does Formula Choice Matter?

The use of eHF with LGG showing acquisition of tolerance sooner than when eHF without LGG and amino acid based formula given.

RB Canani, et al. *Pediatrics*. 2013;163(3):771-777.



Optimizing Nutrition of Preterm Infant with CMPA

For Preterm Infant at 1800 grams in weight

	ESPGHAN Recommendations	Pregestimil and Nutramigen with & without LGG at 24 kcal/oz	Alimentum at 24 kcal/oz
ml/kg/day	135-200	150-160	150-160
kcal/kg/day	110-135	120-128	120-128
gms of protein/kg/day	3.5-4	3.4-3.6	3.3-3.5
mg of Calcium/kg/day	120-140	113-120	126-134
mg of Phosphorus/kg/day	60-90	62-67	90-96



Optimizing Nutrition of Preterm Infant with CMPA

For Preterm Infant at 1800 grams in weight

	ESPGHAN Recommendations	Elecare at 22 kcal/oz	Alfamino at 24 kcal/oz	Puramino at 24 kcal/oz	Neocate Infant at 24 kcal/oz
ml/kg/day	135-200	155	150-160	150-165	150-160
kcal/kg/day	110-135	114	120-128	120-132	120-128
gms of protein/kg/day	3.5-4	3.5	3.4-3.6	3.4-3.7	3.4-3.6
mg of Calcium/kg/day	120-140	132	143-148	113-124	139-144
mg of Phosphorus/kg/day	60-90	96	94-97	62-69	99-102



Prevention of CMPA

The NIAID, AAAAI, EAACI and AAP recommend breastfeeding for the first 4-6 months to prevent allergies in children.

“The most effective dietary regimen [for allergy prevention] is exclusively breastfeeding for at least 4 to 6 months.”

Host A, et al. Pediatr Allergy Immunol. 2008;19:1-4.



Prevention of CMPA

AAP’s Policy Statement: “There is evidence that breastfeeding for at least 4 months, compared with feeding formula made with intact cow milk protein, prevents or delays the occurrence of atopic dermatitis, cow’s milk allergy, and wheezing in early childhood.”

Greer FR, et al. Pediatrics. 2008;121:183-191.



Prevention of CMPA

When breastfeeding or breast milk is not an option, soy formula should not be considered for the prevention of CMPA.

Guidelines for Diagnosis and Management of Food Allergy in the United States: Report of the NIAID-sponsored Expert Panel. December 2007 (126); Issue 6, Supplement:S1-S58.



Prevention of CMPA

Extensively Hydrolyzed formulas may help to prevent CMPA when breast milk is not available, however the research is limited. The cost and availability should be considered.

Guidelines for Diagnosis and Management of Food Allergy in the United States: Report of the NIAID-sponsored Expert Panel. December 2007 (126); Issue 6, Supplement:51-558.



Prevention of CMPA

National Institute of Allergy and Infectious Diseases (NIAID)with National Institutes of Health (NIH) determined that evidence for maternal dietary restriction during pregnancy and lactation was not necessary for prevention.

[http://www.jacionline.org/article/S0091-6749\(10\)01566-6/fulltext.](http://www.jacionline.org/article/S0091-6749(10)01566-6/fulltext)



Periodic Re-evaluation

According to Host et al, approximately 50% of children develop tolerance of CMP by 1 year of age, more than 75% by 3 years of age, and more than 90% by 6 years of age

Host A, Halcken, S, Muraro A, et al. *Pediatr Allergy Immunol.* 2008;19:1-4



Periodic Re-evaluation

- Re-evaluation with oral food challenge recommended:
 - **Yearly** {Diagnosis and Rationale for Action against Cow's Milk Allergy (DRACMA) Guidelines from World Allergy Organization (WAO) in 2010}
 - **6 to 12 months** (ESPGHAN)



Periodic Re-evaluation

However, the expert panel for the US guidelines states that a re-evaluation schedule is not supported by objective evidence.

Guidelines for Diagnosis and Management of Food Allergy in the United States: Report of the NIAID-sponsored Expert Panel, December 2007 (126); Issue 6, Supplement:51-558.



Summary

- Signs and symptoms of the types of CMPA
- Guidelines on how to use diagnostic tests and diagnostic elimination diet
- Strategies for nutritional therapies
 - Maternal elimination diet for breastfed infants
 - Specialized formulas
- Reduce misdiagnosis of infants



About Prolacta Bioscience®

Prolacta develops clinically proven, high-value products derived from human milk that are designed to meet the needs of extremely premature infants in the Neonatal Intensive Care Unit.

info@prolacta.com • www.prolacta.com





Q&A





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