bsaci guideline for the diagnosis and management of cow’s milk allergy

Definition and mechanism
CMPA is defined as a reproducible adverse reaction to one or more milk proteins mediated by an immune mechanism. An underlying immunological mechanism distinguishes CMPA from other adverse reactions to milk, e.g. lactose intolerance.

CMPA is classified as:
1. Immediate onset (usually IgE mediated) typically with skin, respiratory, gastrointestinal and rarely cardiovascular symptoms.
2. Delayed onset (non-IgE or combined IgE / non-IgE) with gastrointestinal symptoms and / or eczema.

Prevalence, onset and evolution
CMPA affects 2-3% of children, presenting typically at 3-6 months (rarely after 12 months).

Clinical presentation and diagnostic evaluation
Immediate onset (within minutes to two hours)
Presenting with symptoms affecting the:
1. Skin: urticaria, pruritis and angioedema.
2. Gut: abdominal pain, vomiting (repeated or profuse), diarrhea.
3. Respiratory tract: red/itchy eyes, blocked/runny nose, sneezing, cough, wheeze, breathlessness.

Wide range in severity from skin symptoms only, to life-threatening or fatal anaphylaxis. Presentation mild in the majority.

Delayed onset (frequently delayed - hours to days)
Presenting with:
1. Gastrointestinal symptoms (range of symptoms and severity).
   - Blood in stool in otherwise well child.
   - Vomiting in irritable child with back arching and screaming.
   - Feed refusal and aversion to lumps.
   - Dysphagia (possible oesophageal eosinophilia; warrants biopsy).
   - Diarrhoea: often protracted with propensity to faecalotoring.
   - Constipation: straining with defecation, but producing soft stools.
   - Unwell child: delayed onset protracted vomiting and diarrhoea.

Wide range in severity from well child with bloody stools to unwell shocked child after profuse vomiting and diarrhoea (FPIES).

Diagnostic evaluation (confirmation of suggestive history)
Immediate onset: typical symptoms confirmed by SPT >3mm. atypical or absent symptoms need SPT >5mm.

Delayed onset: GI symptoms: milk exclusion and assess symptoms. Eczema: milk exclusion 2-6wks, then reintroduction.

Reintroduction (rate of resolution varies so timing and location (home or hospital) must be individually assessed)
Guidance for reintroduction of cow’s milk
1. Consider reintroduction from 12 months.
2. Review every 6-12 months (repeat SPT if IgE mediated).
3. Start with baked milk as less allergenic.
4. Home reintroduction may be attempted where:
   - Mild symptoms on noteworthy exposure.
   - No reaction in past 6 months.
   - Significant reduction in SPT (in IgE mediated).
5. Hospital reintroduction recommended in:
   - Any previous moderate to severe reaction (incl. FPIES).
   - Less severe reaction to trace exposure.
   - Regular asthma preventative treatment.
   - Multiple or complex allergies.
   - Parents unable to understand protocol

Once tolerance is established, encourage greater exposure of less processed milk as in ‘Milk Ladder’

Dietary avoidance (avoidance advice)
How to read a label for a milk-free diet

Look out on labels for any of the following ingredients:
- Butter, butter fat, oil, acid, ester or milk
- Casein, casein hydrolysate, sodium or calcium caseinate
- Cow’s milk (fresh, UHT, dried, powdered, condensed)
- Cheese, cottage cheese
- Cream, artificial cream
- Curds, ghee, custard
- Lactalbumin, lactoglobulin, lactoferrin
- Milk solids (non-fat milk solids milk sugar or protein)
- Animal milks (goat’s milk)
- Sour cream or milk solids
- Whey, whey powder or syrup sweetener, hydrolysed whey
- Yogurt, fromage frais

Milk is sometimes found hidden in the following:
- Biscuits / baked goods
- Processed meat
- Savoury snacks, soup, gravy
- Pastry, batter

*In EU all pre-packaged must declare milk on allergy list if it is an ingredient

Choice of substitute milks (replacing cow’s milk in diet)

Suitable milk substitutes
- Breast milk (suitable for most with CMPA).
- Hypoallergenic formulas (first choice; AAF for severe CMPA).
- Extensively hydrolysed formulas
  - Apatmil Pept 1, Althéra
  - Nutramigen lipil, Similac Alimentum
  - Pepti Junior, Pregestimil
  - Pedipeptid, MCT peptid

Amino-acid formulas
- Neocate LP
- Nutramigen AA
- Neocate active (>12mo)
- Neocate advance (>12mo)

Unsuitable (U) or less desirable (L) milk substitutes
U - Heated or processed fresh cow’s milk.
U - Other mammalian milks (e.g. goat’s, donkey’s, etc.).
L - Alternative milk ‘beverages’ (e.g. almond, coconut, rice, soya) to be used under dietetic guidance in older children.

Milk Ladder
Factors considered:
1. Volume or quantity
2. Effect of heating – degree and duration
3. Wheat matrix effect

More denatured / Lower protein dose
Less denatured / High protein dose
More allergic

Stage 1
Small crumb of biscuit with <1g of CMP per biscuit.
Build up to whole biscuit over 5 weeks.

Stage 2
Other baked products containing CMP, e.g. biscuits, cakes, muffins, waffles, scotch pancakes.
Butter, margarine Cheese powder flavouring
Products containing cooked cheese or whole cow’s milk as heated ingredient e.g. custard, cheese sauce, pizza, rice pudding.
Chocolate, chocolate coated items.
Fermented desserts Yogurt

Stage 3
Fresh milk products.

Stage 4
Less denatured / High protein dose
More allergic

NOTES (all stages):
- Proceed with caution
- Classification not perfect, so step up may be bigger than expected, esp. in Stage 3.
- If reacting, stop and go back to lower stage

developed by the bsaci standards of care committee