Diarrhoea and vomiting in children

NICE has produced guidelines on the management of diarrhoea and vomiting in children (NICE 2009 CG84). They are designed to be used alongside the NICE guidelines on fever. I think you will agree that they contain nothing very surprising, and the words ‘grandmothers’ and ‘sucking eggs’ may spring to mind for some of you!

There are a few useful titbits where our practice perhaps differs:

When should you send a stool culture?

Should infants’ milk be stopped until they recover?

When is oral rehydration solution needed?

How long will it take for the child to recover?

NICE on diarrhoea and vomiting in children

**Diagnosis**

- Suspect gastroenteritis if there is sudden:
  - Change to loose watery stools, or
  - Onset of vomiting.
- Ask about potential contacts and any foreign travel.
- Notify public health if you suspect an outbreak of gastroenteritis.
- Consider alternative diagnosis if:
  - Temperature >38°C (under 3m).
  - Bulging fontanelle in infants.
  - Temperature >39°C (over 3m).
  - Non-blanching rash.
  - Short of breath or tachypnea.
  - Blood and/or mucus in stool or bilious (green) vomit.
  - Altered conscious state.
  - Severe or localised abdominal pain.
  - Neck stiffness.
  - Abdominal distension or rebound tenderness.

**Investigations**

- Perform stool microscopy if:
  - You suspect sepsicaemia or
  - There is blood or mucus in the stool or
  - The child is immunocompromised.
- Consider performing stool microscopy if:
  - The child has been abroad or
  - The diarrhoea has not improved by day 7 or
  - You are uncertain about the diagnosis.

**Assess dehydration**

NICE considers some children to be at increased risk of developing dehydration. These are:

- Children younger than 1y, especially those under 6m and infants who were low birth weight.
- Children passing 6 or more stools, or vomiting >3 times in 24h.
- Children who have not been offered or have been unable to tolerate supplemental fluids.
- Infants who have stopped breast feeding during the illness.
- Children with signs of malnutrition.

These children may need face-to-face assessment, and early review in the event of a change in condition.

The table of symptoms and signs suggestive of clinical dehydration and shock is featured in the article Feverish illness in children.

Consider hypernatraemic dehydration if there are jittery movements, increased muscle tone, hyperreflexia, convulsions, drowsiness or coma.

**Fluid management**

- No clinical dehydration:
• Continue breast feeding and other milk feeds.
• Discourage fruit juice and carbonated drinks (but see below for our update on this).
• Offer low osmolarity oral rehydration solution to those at increased risk of dehydration.

Clinical dehydration:
• 50mL/kg low osmolarity oral rehydration solution (ORS) over 4h (e.g. Dioralyte).
• Continue supplementing with breast feeds, milk feeds and water.
• If unable to tolerate by mouth, consider nasogastric oral rehydration solution (would require admission).
• Regular reassessment.

Clinical shock:
• Admit for IV fluids (protocol for secondary care in guidelines).

Advice for parents and carers
• Specific safety netting for signs of dehydration, and specific follow up if necessary.
• Diarrhoea usually lasts for an average of 5–7d and stops completely within 2w; vomiting usually stops within 3d.
• Washing hands with soap and drying prevents spread of gastroenteritis, particularly after toileting and nappy changes, and before preparing food.
• Children should not attend school or childcare until 48h after last episode of diarrhoea or vomiting.
• Children should not swim in swimming pools for 2w after last episode of diarrhoea.

When is oral rehydration solution needed?

Urgh! Oral rehydration solution tastes disgusting!

NICE advises us to offer oral rehydration solution to those ‘at increased risk’ of dehydration (see above), but there is some controversy about this. So, should we be switching to fruit juice instead? ONLY in the least dehydrated cases!

You may have heard of a useful study which looked at whether oral rehydration solution is better than fruit juice for children with diarrhoea and vomiting. This study looked at children presenting to emergency departments in Canada, and was a well-designed, single-blind, randomised controlled trial of almost 700 patients. Children with diarrhoea or vomiting, and either no or mild dehydration, were randomised to either oral rehydration solution or dilute apple juice (JAMA 2016;315(18):1966).

The group treated with dilute apple juice was less likely to end up needing IV fluids. Other outcomes such as hospital admission, prolonged symptoms or need for clinical reassessment were not significantly different between the groups.

However, 68% of the children in the trial showed no clinical signs of dehydration, and the rest of the group showed only very mild dehydration. Interestingly, researchers don’t seem to have asked about urine output, though they did use a validated clinical dehydration scale to assess severity (Paediatrics 2008;122(3):545).

What can we tell from this?
• We can stop using oral rehydration solution ‘just in case’ in non-dehydrated children with gastroenteritis.
• There had previously been concerns that the high sugar content in fruit juice might increase diarrhoea but this was not shown in this study.
• For children with any clinical signs of moderate dehydration, oral rehydration solution may still be the most appropriate option PROVIDING the child will drink it!

Probiotics for children with gastroenteritis


They found no evidence of benefit from using probiotics (Lactobacillus rhamnosus and L. helveticus) in children with mild to moderate acute gastroenteritis:
• No reduction in progression to moderate or severe gastroenteritis.
• No reduction in duration of D+V symptoms.
• No reduction in rates of household transmission.
• No reduction in acute GP visits.
• No reduction in adverse events.

Both trials were multicentre and each recruited around 900 children presenting to US or Canadian Emergency Departments with acute gastroenteritis. The participants were randomised to a 5-day course of either probiotics or placebo, and were followed-up by email daily for 5 days, then at 14 and 28 days. The trials had similar outcome measures, as shown above. There were no significant differences in adverse events, but one trial did report increased wheeze in the probiotic group.
Stool culture will not be needed for the majority of children we see. Only consider if duration of symptoms >7d, foreign travel, blood and mucus, or immunocompromise.

All children should be assessed for signs of dehydration.

Infants who are not dehydrated can continue breast feeding/formula.

In children who are not dehydrated, oral rehydration solution is only needed in those at highest risk: those <1y, and those with >6 loose stools or 3 vomits in 24h.

In those who are dehydrated, 50 ml/kg of oral rehydration solution should be offered over 4h, and early reassessment made to decide whether to admit.

If children are admitted, NG rehydration is preferential to IV rehydration because of the reduced risk of electrolyte imbalance.

Give a realistic time scale for recovery – usually 3d for vomiting and 5–7d for diarrhoea.

Encourage basic hygiene – hand washing for all and avoiding swimming pools for 2w after last episode.

Could you design a practice leaflet that gives this information to parents and encourages self-management?

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