From the Literature with Dr Maryln Emedo, paediatric registrar and education fellow at King’s College Hospital, London

Arch Dis Child Mar 16: Validation of two algorithms for managing children with a non-blanching rash. Riorian FA, Jones L, Clark J. Non-Blanching Rash Audit Group

This study looked at the efficacy of using algorithms to determine how to manage cases of non-blanching rash seen in hospital.

- Non blanching rash (NBR – including both petechiae and purpura) is one of the most recognised signs of possible meningococcal disease (MCD) by both lay people and health care professionals, although it is absent in about 20% of cases.
- Early recognition and appropriate treatment of NBR is crucial as missing a case of meningococcal disease can have disastrous consequences. Treating all cases of NBR with immediate IV broad spectrum antibiotics however is also undesirable in clinical practice, the majority of children we see will have other diagnoses, such as viral illnesses, Henoch Schonlein Purpura (HSP) or idiopathic thrombocytopenia (ITP).
- The NICE guideline on bacterial meningitis includes an algorithm for managing children who have a NBR as part of their presentation. Other studies have attempted to rationalise which children with a NBR should be treated eg. Brogan and Raffles, ADC 2000. Riorian et al created their own management algorithm (from Newcastle, Birmingham and Liverpool – somewhat confusingly termed the NBL algorithm) and compared the two approaches.
- This study used data from 8 cohorts; a total of 625 children aged between 1 month and 15 years, presenting with NBR. The NBL algorithm was applied prospectively to certain groups, and the NICE guideline was then applied retrospectively across all cases.
- Cases of MCD were defined as either “confirmed” (culture positive) or “probable” (clinically unwell with a high index of suspicion, cultures negative). 145 of the 625 children in this study (23%) had either confirmed or probable meningococcal disease.
- The NBL algorithm recommended treatment for 37% of children, picking up all 145 cases of confirmed or suspected MCD with a sensitivity of 100% and a specificity of 82%.
- In one prospective cohort 15 children had HSP, and as dictated by the NBL algorithm should have had immediate IV antibiotics; however clinicians utilised their clinical judgement and withheld antibiotics for these children. There was however one child in a different cohort similarly thought to have HSP thus not immediately treated; unfortunately the diagnosis was in fact MCD and he required PICU treatment for septic shock.
- The NICE algorithm recommended treating 61% (382) of children with antibiotics which included 141/145 of the confirmed/suspected MCD patients. The four that would not have received treatment included 2 who presented afebrile (but did have high CRPs), and one leucopaenic – ITP does not recommend CRP measurement in afebrile children, and does not take leucopaenia into account – although this is a known sign of sepsis. The sensitivity was thus 97% and specificity 50% of the NBL algorithm, thus suggesting more children would receive unnecessary antibiotics using the NICE algorithm rather than the NBL one, and there is a small increased likelihood of missing cases of MCD.
- The study demonstrates the utility of algorithmic management of children presenting with NBR. The higher specificity of the NBL algorithm over the NICE algorithm may be due to the fact that only meningism, cap refill > 5s and irritability/lethargy are included as symptoms/signs which might suggest meningococcal disease, whereas NICE has a much longer list of other symptoms/signs which are considered possibly significant thereby increasing the propensity to over treat.

Benign acute childhood myositis (BACM) - Good 2005 paper on aetiology and management in the ED available in full text here. Sudden onset of muscle pain predominantly affecting the calves of school age children. Often can’t weight bear, usually preceded by coryza, neurology is normal (if not, think is this Guillain Barre?). High CK, normal U & Es, lowish WBC and platelets. Usually resolves with no treatment. IV fluids probably unnecessary unless there are concerns about rhabdomyolysis (is their urine the colour of coca-cola or dipstick positive for blood? If so, refer.). BACM is not really seen in adults - possibly because it occurs only in ’flu naive people. Click here for the Whittington Hospital patients’ information leaflet.

Intravenous fluid therapy in children and young people in hospital. NICE guideline (NG29), December 2015

- Comprehensive, prescriptive guideline on prescribing and managing IV fluids in the under 16s. PDF of 6 algorithms here.
- Salient points of guideline:
  - Pay attention to 12 and 24 hourly fluid balance subtotals
  - IV fluid resuscitation is 20mls/kg normal saline over < 10 mins, 10-20mls/kg in neonates
  - Maintenance isotonic fluids are 100mls/kg for first 10kgs, 50mls/kg for next 10kgs of weight and 20mls/kg for the rest (males need no more than 2500mls total, females 2000mls)
  - Restrict fluids to 50-80% if there is a risk of hyponatraemia
  - Treat symptomatic hyponatraemia with 2mls/kg of 2.7% sodium chloride over 10-15 minutes.
  - Keep sodium shifts to < 12mmol/L/24 hours

Children with gastroenteritis in the UK only rarely need IV fluids! Luton has a good guide to assessing D&V in primary care. Click here for the abbreviated Whipp Cross guideline on D&V.

Exceptions to the above IV fluids guideline:
- 1. Burns – LSEBN guideline here
- 2. Diabetic ketoacidosis – 2015 BSPED calculator

Reintroducing egg in the egg allergic child (see the BSACI guide and a slightly shortened version of that document that I have put here):

<table>
<thead>
<tr>
<th>Well cooked egg</th>
<th>Loosely cooked egg</th>
<th>Raw egg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage 1</td>
<td>Stage 2</td>
<td>Stage 3</td>
</tr>
<tr>
<td>Cakes</td>
<td>Pancakes and Yorkshire pudding</td>
<td>Fresh mousse</td>
</tr>
<tr>
<td>Dried egg pasta</td>
<td>Quiche</td>
<td>Sorbet</td>
</tr>
<tr>
<td>Egg in sauces</td>
<td>Scrambled egg</td>
<td>Royal icing (both fresh powdered icing sugar)</td>
</tr>
<tr>
<td>Soft boiled egg</td>
<td>Horseradish sauce</td>
<td></td>
</tr>
<tr>
<td>Soft finger</td>
<td>Fried egg</td>
<td>Tartar sauce</td>
</tr>
<tr>
<td>Spiced finger</td>
<td>Omelette</td>
<td>Raw egg in cake mix and other dishes avoiding cooking</td>
</tr>
<tr>
<td>Vegetable</td>
<td>Egg yolk</td>
<td></td>
</tr>
<tr>
<td>Gravy sauce</td>
<td>Egg in breadcrumbs</td>
<td></td>
</tr>
<tr>
<td>Hard boiled egg</td>
<td>Hollandaise sauce</td>
<td></td>
</tr>
<tr>
<td>Egg custard</td>
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<td></td>
</tr>
</tbody>
</table>

* This should be the last food introduced within Stage 1. Please ensure the egg is well cooked and has no runny white or yolk.

From King’s College guideline on reintroducing egg


Did you know?

The usual MMR vaccine should be given to egg allergic children.

I have also put the 4 page guide to reintroducing egg at home under the Primary Care guidelines tab [http://www.paediatricpearls.co.uk/primary-care-guidelines/].