Paediatric Infectious Diseases: *Top tips and hot topics*

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Learning Objectives

- Diagnoses not to miss
  - Red flags

- Common presentations
  - When to refer

- Questions around vaccinations
  - Changes
  - Contraindications
Case: Megan

18 months old
9 episodes of febrile illness since 5 months old
4 courses of oral antibiotics for chest / throat infections last year
1 hospital admission with pneumonia aged 10 months
UTI 6 months ago (normal ultrasound scan)
4 year old sister
Fully vaccinated
Mother teaching assistant. Father double-glazing salesman

Weight fallen from 25\textsuperscript{th} to 9\textsuperscript{th} centile. Height 9\textsuperscript{th} centile

Does she have immunodeficiency?
Case: Morgan

18 months old
Right middle lobe pneumonia
Previous episode of right-sided pneumonia 3 months ago
Improved with intravenous antibiotics
Intermittent cough in between.
Weight fallen from 25th to 9th centile. Height 9th centile
Fully vaccinated

Does she have immunodeficiency?
Other concerns?
When to suspect immunodeficiency

- Rarely immunodeficiency
- Asthma
- Allergic rhinosinusitis
- Recurrent viral infection
- Cystic fibrosis

More significant
- growth faltering
- admission for IVABx

Consider antibody, MBL deficiency
Rarer complement deficiency

Transient hypogammaglobulinaemia of infancy
Case: Manuel

6 years old
Recurrent boils.
Lanced by GP previously
Others spontaneously ruptured
Healed leaving faint scars

Does he have immunodeficiency?
How to manage?
When to suspect immunodeficiency

Skin infection only
- rarely immunodeficiency
- diabetes
- virulent *S. aureus* strain

Deep abscess
- Recurrent deep infection
- Recurrent bone/joint infection
  - phagocyte disorders
    - CGD, hyper IgE
    - antibody deficiency

Recurrent meningococcal disease
- terminal complement deficiency

Recurrent pyogenic infection
Staphylococcus aureus suppression

- Hibiscrub body wash - Days 1,2,3,4,5
- Hibiscrub as shampoo – Days 1,3,5
- Nasal mupirocin – Days 1,2,3,4,5

Treat patient

If recurs, treat whole family

Octenisan wash lotion for infants / eczematous skin
Case: Darcey

- 11yo girl
- Camping holiday in South Downs
- Flu-like illness last 2 days
- Lethargic
- Rash today
Lyme Disease

- Empiric treatment based on supportive history and erythema migrans rash
  - Serology negative for up to 2 weeks
  - Non-CNS: Amoxycillin for 14 days
  - CNS or cardiac: Ceftriaxone 21 days
  - Doxycycline only if >12yo
- Complications include facial nerve palsy
Case: Samuel

- 3yo
- Fever for 5 days
- Blanching red rash, dry lips, red tongue
- Cervical lymphadenopathy
Scarlet fever

Invasive group A streptococcus

Source: HPE
Scarlet Fever

- **Differential**
  - Adenovirus
  - EBV
  - Kawasaki disease
  - Parvovirus – slapped cheek

- **Differentiating from other conditions**:
  - Sandpaper texture to rash
  - Pastia’s lines: petichiae in axillary folds
  - Pharyngitis (cf to Kawasaki disease)

- **Treatment**
  - Penicillin V for 10 days
  - Azithromycin for 5 days
Kawasaki Disease

- Fever > 5 days + 4/5 of:
  - Conjunctivitis
  - Oral mucositis
  - Cervical lymphadenopathy
  - Rash
  - Extremity changes

- Multiple manifestations
  - BCG site inflammation

- Treatment
  - IVIG 2g/kg +
  - Aspirin 30-60 mg/kg/day
  - Consider steroids

- Complications
  - Coronary Art aneurysm
Case: Naima

- 6yo
- Wakes at night, screaming
  - ?nightmares  ?night terrors
- Vaginal itching and soreness
- Worm noticed on labia minora
- GP saw photo: threadworm – Rx mebendazole
- 1 month later – returned

- Referred to paediatrician

- Paediatrician: concerned about vaginal infestation
- Referred to gynaecologist
- Referred to HTD
Threadworm

- *Enterobius vermicularis*

- Mebendazole 100mg
  - Treat whole family
  - Repeat after 2 weeks
  - Only for age >6 months

- Hygeine
  - Shower perineum on rising
  - Keep nails short and scrub clean
  - Onesies in bed
Case: Khadija

- 13yo
- Diagnosed with asthma aged 6
- Seretide 100 Accuhaler 1 puff bd
- Last admission 3 years ago
- No oral steroids past 2 years

- Cough for past 10 days
- No fever
- No benefit from salbutamol
Pertussis

- **Who is at risk?**
  - Youngest infants (immunise mothers)
  - Teenagers (waning immunity)

- **Diagnosis**
  - <14 days: pernasal swab for PCR
  - (aged 5-16, use oral fluid swab for IgG)
  - >14 days: serology

- **Treatment**
  - <21 days from onset: azithromycin/clarithromycin
Pertussis: chemoprophylaxis

Group 1
Individuals at increased risk of severe complications (‘Vulnerable’)
• Infants under 1 year who have received less than 3 doses of pertussis containing vaccine

Group 2
Individuals at increased risk of transmitting to ‘vulnerable’ individuals in ‘group 1’ who have not received a pertussis containing vaccine more than 1 week and less than 5 years ago
a) Pregnant women (> 32 weeks gestation)
b) Healthcare workers working with infants and pregnant women
c) People whose work involves regular, close or prolonged contact with infants too young to be fully vaccinated (< 4 months)
d) People who share a household with an infant too young to be fully vaccinated (< 4 months)

Only if contact <21 days

Source: HPE
Vaccines

- Recent changes
- Egg allergy and contraindications
Cases of bacterial meningitis and septicaemia have halved in the past 25 years but there are still nearly 10 new cases in the UK every day.

The NHS vaccinates children against Hib, MenC and 13 strains of pneumo meningitis and septicaemia.

- **1989**
  - Hib
  - MenC
  - Pneumo
  - MenB
  - Other

- **2014**
  - MenB

Average UK cases per year since 2000: 3,200

Anyone can get it but young children & teenagers are most at risk.

1 in 10 will die
Invasive pneumococcal disease: can we eradicate it?

Source: HPE
Meningococcal disease: changing times

Source: Meningitis Research Foundation
Meningococcal group B vaccine: *Bexsero*

- Immunogenic in all age groups
- OMV + 3 meningococcal proteins
- OMV component efficacy proven in NZ (73%)
- Strain coverage estimated at 88%
- Likely more febrile reactions

- March 2014
  - JCVI recommended 2+1 schedule (2, 4, 12 months)
Case: Umar and Uthman

- **Umar**
  - 14 years old, observant Muslim family
  - Asthma – well controlled on Seretide Accuhaler
  - Egg and peanut allergy – never anaphylaxis
    - Seasonal flu vaccine?
    - Travelling to Nigeria – Yellow fever vaccine?

- **Uthman**
  - 18 months old
  - Egg allergy
    - MMR?
    - Yellow fever?
## Inactivated intramuscular influenza vaccine

<table>
<thead>
<tr>
<th>Inactivated intramuscular vaccine (number of different brands)</th>
<th>Children aged six months and older and adults, although some of the vaccines are not authorised for young children – see table 19.6</th>
<th>Single injection of 0.5ml (see note above)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Children aged six months to under nine years who have not received influenza vaccine before should receive a second dose of vaccine at least four weeks later.</td>
<td></td>
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</tbody>
</table>

Source: Green Book
## Live attenuated nasal vaccine: *Fluenz*

<table>
<thead>
<tr>
<th>Vaccine type</th>
<th>Authorised age indication</th>
<th>Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Live attenuated intranasal vaccine - <em>Fluenz®</em></td>
<td>Children aged two to under 18 years (see precautions and contraindications)</td>
<td>Single application in each nostril of 0.1ml</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Children NOT in clinical risk groups only require one dose of this vaccine.</td>
</tr>
<tr>
<td></td>
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<td>Children in clinical risk groups aged two to under nine years who have not received influenza vaccine before should receive a second dose of vaccine at least four weeks later.</td>
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**Greater efficacy**
- Broader strain coverage
- Longer lasting protection

**Why use this if <2yo highest risk?**
- Herd protection

Source: Green Book
Live attenuated nasal vaccine: *Fluenz*

- **Contra-indications**
  - Anaphylaxis to vaccine or components
  - Immunodeficient
  - Immunosuppressed
  - On aspirin
  - Wheezing at the time
  - Asthma BTS Step 4+

- **Not contra-indications**
  - Inhaled steroids
  - Low dose oral steroids
  - Asthma BTS Step 1-3

Source: Green Book
Egg Allergy & Vaccines

Chick embryo fibroblast
MMR

Embryonated hen’s egg
Influenza
Egg Allergy & Influenza Vaccine

Risk of reaction low
Higher than for MMR

- **Inactivated IM vaccine:** ovalbumin <12ug/ml
  Safe in 1° care
  In 2° care: asthma BTS 4+ / egg anaphylaxis

- **LAIV**
  Insufficient safety data
  Contraindicated
  Safety trials in progress ‘SNIFFLE’
Egg Allergy & Yellow Fever Vaccine

Risk of reaction - data more limited

- Live attenuated yellow fever vaccine
  - Contraindicated if egg anaphylaxis

- Vaccine skin prick test and ID test dose
  In specialist clinic (Evelina Childrens Hospital)
Egg Allergy & MMR

Minimal egg protein content
Reactions to gelatine / neomycin rather than egg

- MMR vaccine
  Safe in 1° care
  If history of anaphylaxis to previous vaccines, refer to allergy clinic
LAIV – contains porcine gelatine

Rabbi Abraham Adler from the Kashrus and Medicines Information Service, said:
*It should be noted that according to Jewish laws, there is no problem with porcine or other animal derived ingredients in non-oral products. This includes vaccines, including those administered via the nose, injections, suppositories, creams and ointments.*

In 2001, the World Health Organization consulted with over 100 Muslim scholars and confirmed that the gelatine used is considered transformed. A summary report on the findings of more than one hundred Islamic legal scholars who met in 1995 to clarify Islamic purity laws states the following:
*Transformation which means the conversion of a substance into another substance, different in characteristics, changes substances that are judicially impure into pure substances, and changes substances that are prohibited into lawful and permissible substances.*
Referral pathways
HTD walk-in or Phone or Written Referral < 18 years
If unsure regarding urgency, discuss with paeds reg

ED walk-in < 18 years

Non-urgent
Paediatric ID clinic
(1st + 3rd Monday PM)
Children & Young People’s Outpatients
Send referral to:
PaedsGrading@uclh.nhs.uk
or request referral via Choose & Book

Next few days
Paediatric Rapid Referral Clinic
(Mon-Fri)
Children & Young People’s Outpatients
Send referral to:
PaedRapidReferrals@nhs.net
or fax to:
0203 447 9381

< 16 years
or
safeguarding concerns
Direct to ED
Refer paediatrics
Bleep 5301
Further advice:
Tropical concerns: HTD reg
Non-tropical: Dr Cohen / GOSH

> 16 years
and
no safeguarding concerns
HTD walk-in Clinic
If admitted:
notify paeds reg
(joint care)

Possible safeguarding concerns?
Have you considered – trafficking – sexual exploitation?
9-5 Child safeguarding Named Nurse Polly Smith
(07984389643)
24 hours Paediatric Reg or Consultant

Contacts
Paediatric reg bleep 5301
Paediatric consultant 07803 853567
HTD registrar 07908 250 924

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