The Febrile Child

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Format of talk

- Welcome
- Objectives
- Questions at the end, please
- Interactive areas
Learning objectives

By the end of this talk, you should –

- Have reappraised and improved your knowledge and approach to the child with a fever
- Have reassessed your practical skills & techniques re. the measurement and interpretation of a raised temperature
- Be in a position to access and use both local and international guidelines and tools
- Synthesised, through the use of examples, a diagnostic & management approach that may be different to the one you currently use
- Have shared and disseminated your own skills & knowledge with the rest of the room
Focus

Where do you start.....?

Focus will be:

COMMON THINGS HAPPEN COMMONLY – SO DON’T MISS THEM

THE BIGGEST WORRY IS IN THE CHILD < 36 MONTHS

WHO / WHEN SHOULD I REFER?
Exclusions

- Rare disorders, or rare presentations of common disorders
- Disorders where fever is not a major diagnostic feature
- Analysis of patterns of fever (hectic, Pel Ebstein, typhoidal etc) – GP’s don’t often see them!
Red slides
Part 1

The scope of the problem
Children (esp. <5yrs) with fever account for a significant percentage of ‘self’ referrals to primary care physicians, CED, etc
Avon study, UK (NICE Guidelines 2007)
Mean GP consultation rate = 3.7 per child per year
Almost double that rate for children < 4yrs
Infection/resp disorders made up 40% of consultations
34% of out-of-hours calls concerned children <5yrs: fever was a concern in 52% age <12 mo, 64% in those 1-5 yrs

Dale et al *Nurs Std* 1998
Saxena et al *BMJ* 1999
McCormick & Fleming *HMSO* 1995
<table>
<thead>
<tr>
<th>Age/fever</th>
<th>% underlying bacterial infection</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 2yrs</td>
<td>“about 3%...with rectal temp &gt; 38.9 have a potentially serious bacterial infection”</td>
</tr>
<tr>
<td>&lt; 6 weeks, any fever</td>
<td>~15%: possibility of rapidly progressive disease</td>
</tr>
<tr>
<td>6/52 – 3mo, any fever</td>
<td>~6%</td>
</tr>
<tr>
<td>3mo – 2 yrs, fever &gt;38.9</td>
<td>“ …in children FWF…bacteraemia rate of ~2%”</td>
</tr>
</tbody>
</table>
Part 2: How do we measure and what is abnormal?
Straw Poll – what would you use to measure temp in an 8 mo baby?
How do we measure?
Oral is out?

Mercury is out

Alcohol was never in

Forehead measurement—no good
Straw Poll – what would you use to measure temp in an 8 mo baby?

NICE guidelines:
- Not oral or rectal for <5yrs
- Electronic thermometer, axilla
- Chemical dot thermometer, axilla
- IR tympanic thermometer

Starship guidelines:
- Tympanic membrane inaccurate in those < 6 mo.
- Rectal or TM (if >6mo)
- Set TM to ‘rectal equivalent’
- Axillary temps inaccurate

Contraindications:
- FB or other material in ear canals
- ‘Abnormalities’ of the ears (inc the very young child)
- Peritonism
- Rectal bleeding
How do we assess?

Parents

- **Feel**
  - Back of the hand on the forehead
  - Under the clothes
  - Axilla

- **Measure**
  - Classic thermometers
  - Thermo-dots, -scans, strips etc
  - Digital thermometers
  - Ear thermometers

‘Professionals’

- **Feel**
  - Same methods
  - Assessment of CRT, temperature gradients, ‘levels’ along limbs etc

- **Measure**
  - Same as before, plus…
  - Rectal
  - Greater reliance on digital/ear thermometers, assessments of core/peripheral difference etc

“…reported parental perception of a fever…considered valid and taken seriously”
What do we class as abnormal?

- Very varying cut-offs
- SSH: up to 3 mo.: “any fever i.e. >38°C”
- SSH: 3mo to 2 yrs, >38.9°C
- NICE: “an elevation of body temperature above the normal diurnal variation”
- eMedicine: makes points re. diurnal variation, gives references ranges, advises 4 minute measuring period (!), defines fever as “rectal temp => 38°C”
Part 3:

What is the significance of fever?
<table>
<thead>
<tr>
<th>Condition</th>
<th>Description</th>
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<tbody>
<tr>
<td>Fever</td>
<td>38°C if &lt; 90 days 39°C if 3-36 mo</td>
</tr>
<tr>
<td>Fever without a source*</td>
<td>An acute febrile illness in which the aetiology is not apparent</td>
</tr>
<tr>
<td>Occult bacteremia</td>
<td>Presence of pathogenic bacteria in the blood without the clinical appearance of toxicity</td>
</tr>
<tr>
<td>Serious bacterial infection</td>
<td>Meningitis, bacteremia, sepsis, pneumonia, UTI, bone/joint infection, enteritis</td>
</tr>
<tr>
<td>Toxic appearing child</td>
<td>Defined by:</td>
</tr>
<tr>
<td></td>
<td>1. Lethargy</td>
</tr>
<tr>
<td></td>
<td>2. Poor perfusion</td>
</tr>
<tr>
<td></td>
<td>3. Abnormal ventilation (hypo, hyper, cyanosis)</td>
</tr>
</tbody>
</table>

* Not same as PUO
“Fever is not a cefotaxime-deficiency state”

Seen above the entrance to the pediatric receiving room (Dallas, Texas)
Fever is **not** an illness
Why do we get fever?

“re-setting of the hypothalamic thermostat”
What is a significant fever?

- What do they look like? Are they ‘miserable’?
- Children change
- Response to simple measures
- The value of a period of observation
- Is it always a bad thing?

FEVER AS A FRIEND (?)
On average, most toddlers will have ~ 8 - 10 ‘infections’ per annum, many accompanied by fever. That’s often > 1 per month…

…and it’s NORMAL
Part 4

How do we assess the underlying cause?
An educational tool for Health Care Practitioners, to aid in recognition of serious illness in children.

Produced by: Dr Ffion Davies, MBChB, MRCPCH, FFAEM, Consultant in Emergency Medicine, Leicester Royal Infirmary.
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Fever is a piece in the patient jigsaw
All fevers start off as a ‘fever of unknown origin’
Causes of a ‘fever of unknown origin’

- Infections 95%
- Other
  - Drugs & toxins
  - Connective tissue disease
  - Neoplasms
  - Metabolic
  - CNS
  - Miscellaneous e.g. immunisation, KD
Infectious causes of febrile illnesses

The majority are viral:

- Melbourne study
  - 574 children 3-36 mo. Temp >39°
  - 75% viral – URTI, LRTI, gastroenteritis
  - 13% otitis media
  - 9% bacterial pneumonia
  - 7% UTI

NZ studies similar: ~70% viral aetiology
Is it bacterial?

Is it viral?

Is it protozoal?

...or is it fungal?
Viral v. bacterial?: some suggestions

Infections 95%

- Pattern of fever
- Response to antipyretics
- Degree of ‘illness’
- Generalisation of Sx
  - Diffuseness
  - Bilaterality
- Progression
- Course over time
- Lab/other tests
Lightwood’s Law

“Viral infections tend to spread (ears, throat, skin e.g. measles) whereas bacterial infections tend to localize (one ear, lobe of lung, pointing abscess)”
The history

“So, Mr. Fenton . . . Let's begin with your mother.”
The history: things to focus on

- Duration
- Height of fever?
- Contact history, inc animals
- Travel
- Associated symptoms
- Response to simple measures?
- Immunisation history
- Pre-treatment?
- Progress over time
How many in this room now would feel themselves capable of doing either basic or advanced life support in a young child?
Clinical assessment

- **A**: airway
- **B**: breathing
- **C**: circulation
- **D**: disability i.e. neurological disability

TELLS YOU NOT ONLY WHAT TO DO BUT THE ORDER IN WHICH YOU DO IT
ABCDENTT

- AIRWAY
- BREATHING
- CIRCULATION
- DISABILITY (AVPU)
- ENT
- TEMPERATURE
Clinical assessment

- That first look….
- That second look
- Head-to-toe
- ENT exam
- Joints & bones
- Kernig’s, photophobia, neck stiffness, etc

“Wait a minute here, Mr. Crumple – maybe it isn’t kidney stones after all.”