Use and abuse of antimicrobials-a paediatric perspective

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Outline

- Current trends from surveillance
- Likelihood of bacterial infection
- Benefits versus harm of antibiotic Rx
- Judicious use of antibiotics
- Some clinical senarios

1 in 5 visits to a paediatric health care provider (FP) ambulatory visits antibiotic is prescribed.. 50 million Ab prescriptions / year- USA

Most ARIs - nose throat, sinuses : predominantly VIRAL
10 million Ab prescriptions for this

Pediatrics
December 2013, VOLUME 132 / ISSUE 6
From the American Academy of Pediatrics
Clinical Report
Principles of Judicious Antibiotic Prescribing for Upper Respiratory Tract Infections in Pediatrics. Adam L. Hersh, Mary Anne Jackson, Lauri A. Hicks, the COMMITTEE ON INFECTIOUS DISEASES

- **Growing evidence Ab exposures in early life**
- **disruption of microbial balance…intestine and body..**
- **more inflammatory bowel disease**
- **obesity, eczema, asthma**

- **Recent study**

  - risk of sudden death (adults) azithro ..prolonged QT

- **Well established relationship between Ab exposure and resistance developing- in patients and community level**

- **Limited therapeutic options, resistance difficult to treat**

- **Potential harm**
- **Lack benefit assessment need case by case**

- **Largest number of unplanned visits for medication related adverse events USA 15,000/yr, morbidity and cost**

- Range: mild-diarrhoea, rash

:severe - S-Johnson, life threatening anaphylaxis

-AOM, Pharyngitis, sinusitis- Amoxicillin, Amox-

clav. as 1st line

- **rash, abdo pain, vomiting, diarrhoea [antibiotic vs placebo 44%]**

- Stringent diagnostic criteria disregarded

Evidenced based findings

For: Common cold, non specific ARI, acute cough illness, “Acute bronchitis”

- **symptoms overlap, account for millions of office visits per year**
- **antibiotics prescribed for >70% of the time**

lack of application of guidelines Dx AOM, Ac sinusitis, pharyngitis/ pharyngo- tonsillitis

other illnesss- symptomatic relief, no antibiotics

Recent and clear evidence:

- broad-spectrum antibiotic prescribing increased
- frequently occurs when either no therapy is necessary
- or when narrower-spectrum alternatives are appropriate
- overuse of antibiotics causes avoidable drug-related adverse events
- contributes to antibiotic resistance
- adds unnecessary medical costs
- few new antibiotics to treat antibiotic-resistant infections are under development
- growing health and economic threats of antibiotic resistance make promoting judicious antibiotic prescribing, which encompasses both reducing overuse and ensuring that appropriate agents are prescribed, an urgent public health and patient safety priority

(http://www.cdc.gov/drugresistance/threat-report-2013).

Some influential factors:

Intense and ongoing marketing by pharmaceutical companies

Knowledge, prescribing practices of physicians/ HC providers

CME updates for prescribers by whatever means re current recommendations

Bacterial resistance

- **Important issue with a potentially serious impact globally**
- **Consequence of excessive, inappropriate use of antibiotics**
- **Countries with a reported higher use, higher prevalence**
- **Resistance spreads across borders globally**

Infections caused by resistant bacteria can result in:

- **increased morbidity**
- **increased mortality**
- **increased cost to the state**

Pervasive use /misuse produce many strains of drug resistant bacteria that threaten to set medicine back to the19th century

- CRE (carbapenem resistant Enterobactericeae)

- VRE (vancomycin resistant enterococci)

- MRSA (methicillin resistant Staphylococcus aureus) a few of the drug resistant organisms that have emerged

History, examination

- Determine the likelihood of a bacterial infection, need for Ab
- overlapping history, symptoms, signs, age, fit criteria

e.g commonly seen conditions

Acute otitis media-red bulging TM, fluid, mobility

Acute bacterial sinusitis, purulent drainage > 5 days

Tonsillo- pharyngitis

Is Ab indicated?
Judicious prescribing strategies?

-select appropriate Ab by resistance patterns

-appropriate dose

-shortest duration required

-observation and delayed prescribing strategies

- *AAP Red book: Committee on Infectious Diseases, 2013–2014*

Infections in Paediatric patients

Very narrow spectrum of antibiotics indicated

1st line empirical Rx

Community acquired infections

Penicillins: Amoxicillin/ Amoxicillin Clav.
Trimethoprim -sulfa (UTIs)
Erythromycin, Azithromycin- very limited
Metronidazole/ clindamycin/ oral caphalosporins - no indications

Inpatient settings:

Neonates - Amp, Gm
>3 months 3rd Cef + Vanco

The use of cultures to prove the organisms implicated cannot be overemphasised

Some common clinical senarios

Frequent causes of Oral ulcers **:**

EBV, CMV

HSV

Enteroviruses (summer) CoxA16 (HFM),A6, ECHO

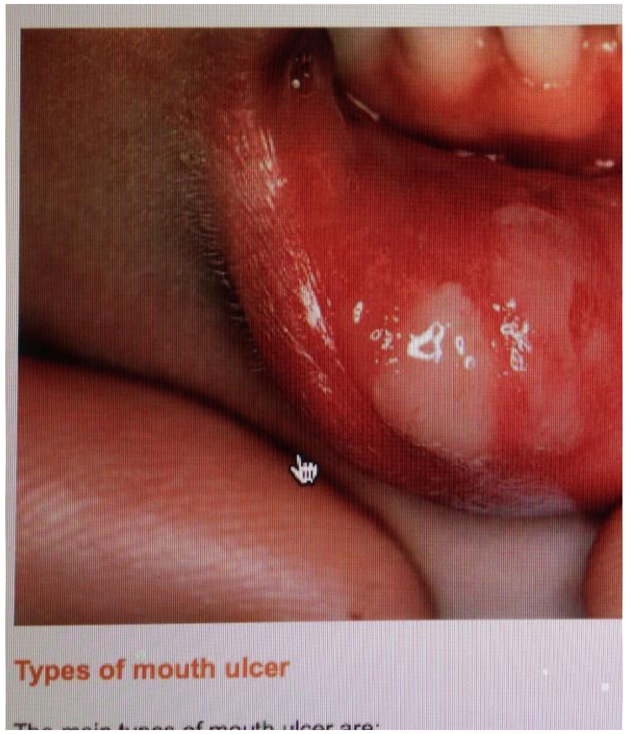
Aphthous

Neutropenic

Food intolerance / allergy- acidity, Vit C - Citrus, Vits, tomatoes, pineapple, etc.

***Gp A BH Strep - Ac Rh fever**

***Diphtheria- resurgence**



<u>Treatment</u>
Antipyretics, topical analgesic
<u>no indication for</u>
- Amoxicillin/ Abs
- Topical steroid combinations

Acute tonsillo-pharyngitis

- **a 3 1/2 year old child**
- **2 days- subjective fever, taking liquids, irritable, vomited x 3 in total**
- **On exam: active, temp 38C on exam, well hydrated, wt, ht. normal, urine output as usual**
- **tonsils enlarged, exudates**

Differential diagnoses?

Acute tonsillo-pharyngitis
- >85% viral
-Infectious mononucleosis (EBV)
- CMV, Enteroviral
- Bacterial - Gp A BH strep (low %)

Acute pharyngitis/tonsillopharyngitis

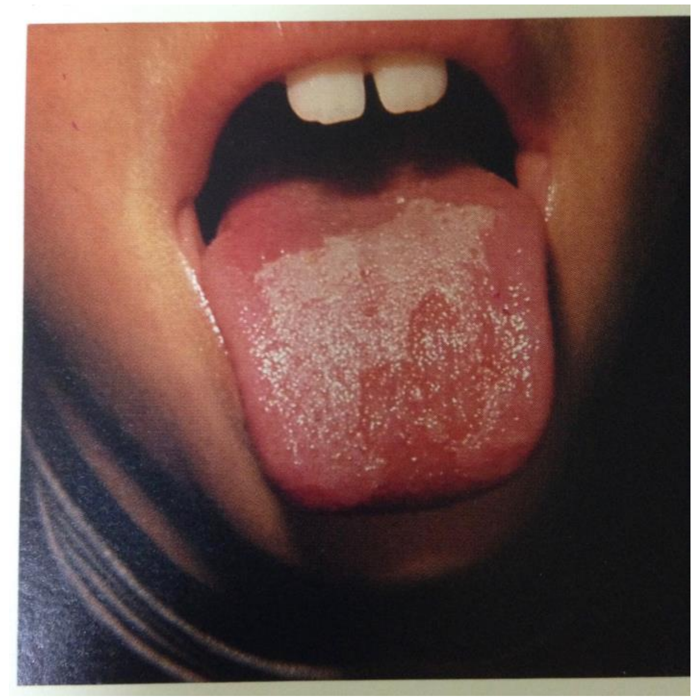
- (with non- specific cough, congestion, fever)
- Dx confirmed by lab testing (rapid/ culture)
- most important - if GAStrep or not
- ARI signs- cough,hoarseness,nasal cong.,oral ulcers,diarr,conj.

<u>VIRAL</u> not GAStrep ..not test for GAStrep

- ***testing not recommended in < 3 yrs: GA Strep pharyngitis and AR Fever uncommon to rare, 15-20% colonisation***

- **A 7 year old, seen in clinic for a fever for 3-4 days, mild headache, no sore throat, slight loss of appetite and energy, otherwise well.**

- **Exam unremarkable except for his tongue**



Diagnosis?

Geographic tongue

- allergy related
- unknown cause

Treatment- symptomatic; no Abs

Amoxicillin-Amox/ Clav remains the recommended drug of choice

Caution re prescribing Azithromycin

-Not a first line for Rx in paediatric conditions
- Used very inappropriately… “good for all bacterial infections”
-Suppression of many flora
-Inadequate coverage for acute sinusitis
(M. catarrhalis, S. pneumoniae, H.influenzae)
- indicated for specific conditions
  (Mycoplasma< 6 yrs pneumonia,Chlamydia- infants)
- Crept into the centre stage, marketing, promotional efforts by pharmaceutical companies
- Best reserved for pen. allergic conditions

Respiratory tract

ARIs

Clinical senario

- **2 year old with fever for 2-3 days, some anorexia, wheezing,cough, nasal discharge (opaque) presents to the Dr.**

Diagnosis: Bronchiolitis

Rx often given

1. Cough medication,
2. Antipyretics
3. Amoxil/Azithromycin
4. Salbutamol

Comment:

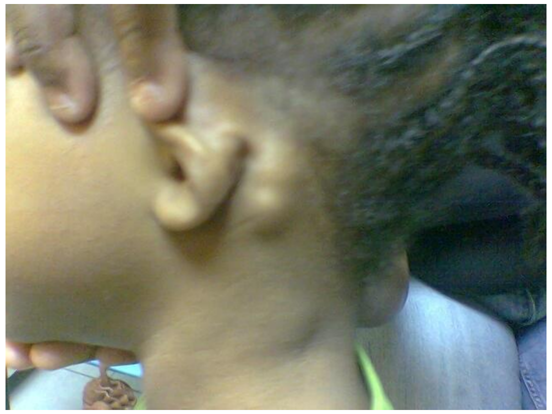
- Compliance issue
- Cost
- Viral illness, self limiting

Acute cervical adenitis

Rx Amoxicillin- exclude Tb, Toxo, HIV, other viral

Skin conditions

Tinea capitis
Topical antifungals will not work
Rx oral Griseofulvin/ other



Impetigo..spreading
after Rx with a topical steroid cream

CASE 1

A 11/2 year old infant presents with a history of fever for 3 days, decreased appetite, a slight runny nose, activity is normal. Examination, unremarkable except for "a red throat".

Answer True or false [for each]

a) A red throat supports a diagnosis of bacterial infection

b) the diagnosis of pharyngitis and an antibiotic is indicated for Gp A BHS

c) treatment with a penicillin for prevention of acute rheumatic fever is warranted in this age group

d) No antibiotic in indicated, the illness is likely viral

e) Symptomatic therapy Rx - antipyretics, fluids, observation

CASE 2.

A 2 year old infant is seen by a physician in clinic with a history of fever for 2 days, being treated with paracetamol for 2 days, decreased appetite and prescribed Amoxil for "a throat infection".

2 days later -The infant is seen by the same physician as fever continues and there is a bumpy rash, periorally, on the body and palms and soles and is told the child is allergic to Amoxil and prescribed Cefadroxil, Fucidin cream, Furasone cream (mometasone). Fever defervesces, improvement.
2 days later and a 2nd opinion sought as the rash spreads and is itchy.

Answer True or false [for each]

a) Amoxil / antibiotic treatment was indicated after 2 days of fever and no specific focus
b) the diagnosis of penicillin allergy is very likely
c) topical therapy is indicated
d) at visit 2 the differential diagnosis should include the hand, foot, mouth syndrome (Coxsakie A 19]
e) with fever for > 3 days and no focus, likely a viral illness: consider dengue, Zik V, ChickV, seasonal -occurring Enteroviruses

Coxsackie- Hand-foot-mouth disease

CASE 3.

A **2 year old**, fully immunised child (DPT, HIB, HepB, Pneumo, polio) presents with a history of fever for 3 days, pain in one ear, runny nose (clear), irritable, ear tugging sometimes.

Examination reveals: fever to 38 C, red ear drums and he is crying. Findings are otherwise normal.

Answer True or false [for each]

a) the diagnosis is acute otitis media, based on examination

b) Azithromycin in indicated

c) Amoxicillin/ Amoxicillin- clavulinic acid is indicated

d) decongestants should be prescribed

e) Symptomatic therapy Rx - antipyretics, fluids, observation

Concluding message

If a paediatric patient presents with fever for > 3-4 days and constitutional symptoms and there is no focus on examination:

Think viral: Dengue fever, Zik V, ChikV


Thank you!