Antimicrobial resistance

18 November
What is “using antibiotics appropriately”?

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• Using just enough of the right kind of antibiotics to kill the specific bacteria making people sick
• It’s not easy to work this out!
• Same symptoms (cough, headache, raised temperature) can be caused by different things (e.g. bacteria, viruses, or just being poorly)
• Working out what is a bacterial as opposed to other infection/something else is (at the moment) done by ...

Growing them! (=slow)
(but sometimes amazing)

What is “using antibiotics appropriately”?

• Using just enough of the right kind of antibiotics to kill the specific bacteria making people sick
• Bacteria can develop resistance to an antibiotic, meaning that it will no longer kill them and won’t stop the infection
• Some antibiotics are “narrow” and kill just some types of bacteria: others are “broad” and kill many different types, including some resistant ones
• Working out what antibiotics bacteria are resistant to is (at the moment) done by …
Growing them in different antibiotics!

Question

• Why don’t we just give the strongest antibiotics to everyone?
  – The strongest antibiotics will kill all the bacteria causing infections, whether or not they are resistant or susceptible to other antibiotics
  – If patients aren’t sick with a bacterial infection at all, giving them strong antibiotics won’t matter
Question

• Why don’t we just give the strongest antibiotics to everyone?
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Bacteria are everywhere!

• Bacteria making us sick are not the only bacteria living on or in us
  – ~1,000,000,000,000 bacteria live in your gut, mostly friendly
• Antibiotics kill “friendly bacteria” as well as bad ones
• And encourage bad bacteria to develop resistance
Resistance

• If a GP prescribes you antibiotics today, what’s your risk of having a resistant rather than a susceptible bacterial infection in the future?

Costelloe et al. BMJ 2010;340:c2096

Resistance

• Urinary tract (bladder) infections

Costelloe et al. BMJ 2010;340:c2096
Resistance

- Urinary tract (bladder) infections

Costelloe et al. BMJ 2010;340:c2096

Resistance

- Respiratory tract (chest) infections

Costelloe et al. BMJ 2010;340:c2096
Vicious cycle

Use more antibiotics

More bacteria develop resistance

More patients get infections with resistant bacteria

Vicious cycle

Use more of the strongest kinds of antibiotics

More bacteria develop resistance

More patients get infections with seriously resistant bacteria
spread in the general population

What is “using antibiotics appropriately”?

- **Using just enough** of the right kind of antibiotics to kill the specific bacteria making people sick
- Whilst you might think that we should know what is just enough, this isn’t necessarily the case
- Antibiotics are mostly old drugs – use is based on historical practice
- Drug companies have a vested interest in getting longer courses licensed (£££)
- Fear of treatment failure with shorter courses – “better safe than sorry”
Bottom line

- Using more antibiotics than we need to now is something that we will get away with for a short time
- But hidden harms from growing resistance means that it is not a safe strategy for the future
- Like climate change, it is difficult to quantify how much we will get away with for how long
- BUT, pre-antibiotics, infection was the commonest cause of death

So... what to do?

- GPs: prescribe fewer antibiotics
  - Most people visiting GPs are not very sick
  - Most people visiting GPs don’t actually have bacterial infections
- “Take care, not antibiotics”
So... what to do?

• Hospitals
  – Most people visiting hospitals are really quite sick
  – Many people visiting hospitals will actually have bacterial infections
• DH guidance “Start SMART, then FOCUS”
  – Get strong antibiotics into patients fast to stop them dying from possibly resistant bacterial infections
  – But take samples first to try to grow bugs from!
  – And focus (narrow) or stop antibiotics when it becomes clearer what is going on (no infection in the first place or got better)

The problem with antibiotics in hospitals

• Starting is pretty good
• Stopping or focussing is NOT
  – Everyone thinks it is a good idea
  – Most hospitals have it in their guidelines
  – BUT where people measure compliance, no one is making any changes
  – Reasons include risk aversion, “just in case”, fear of treatment failure, blame culture, original reason for prescribing not documented well so doctors seeing the patient later are worried they have missed something important, etc etc etc etc etc etc

25/03/2014
So what do we want to do about it?

- Learn from the GPs!
- 30 min internet-based training modules reduced prescriptions by 50%
- Tailored to GPs’
  - Capability
  - Opportunity
  - Motivation
  - to change their Behaviour (“COM-B”)
  - *Qualitative theory in health psychology*

So what do we want to do about it?

- Develop an “intervention” (toolkit or system) to do “review&revise” better in hospitals
  - Information for patients & their relatives/carers
  - Internet-based training for doctors, based on scientific evidence and developed using theories of health psychology
  - A standardised proforma to record important information at hospital admission linked to what they will need to review at 24-48h
  - “Antibiotic prescribing moments”
  - Ward rounds by pharmacists/microbiologists
And...

- Test it rigorously in 36 NHS hospitals!
  - ~600,000 acute/general medical admissions

- We have applied for funding to run these studies, but it takes a long long long time
  - Short-listing in May 2014
  - Final application in October 2014 (if short-listed)
  - Final decision in May 2015
  - Earliest start October 2015 (if funded)

Thank you