Antimicrobial Stewardship in Primary Care

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Plan

Primary Healthcare Systems

Facts about AMR

Current antibiotic consumption

Overuse/Underuse/Misuse of antibiotics

Interventions/Guidelines
Primary Care Systems

• The first level of contact for the population with the healthcare system, bridging health care as close as possible to where people live and work (WHO-Alma Ata Declaration- 1978)

• Strong primary care system produces better health outcomes against lower costs
The strength of primary care in Europe: an international comparative study

Br J Gen Pract. 2013 Nov; 63(616): e742–e750
• Primary care physicians are the first point of contact in 15 EU health systems

• In half of EU countries primary care is organized around solo practice

• Fee-for-service and capitation are still the most common methods of payment in primary care, although use of blended forms of payments is growing

• Patients generally report positive experience with primary care

• Prescribing patterns in primary care raise concerns about appropriate use of medications
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Primary Healthcare Systems

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Interventions/Guidelines
Some facts about AMR/AMS

- Antimicrobial resistance is strongly related to misuse of antimicrobial agents
- Antimicrobial resistance is rising
- There is not new antibiotics on pipeline
  - Vast majority of antibiotic consumption in outpatient setting
  - The main prescribers of antibiotics in primary care settings are general practitioners (GPs), pediatricians and dentists
  - Approximately half of outpatient antibiotic prescribing in humans might be inappropriate, including antibiotic selection, dosing, or duration, in addition to unnecessary antibiotic prescribing

• Antimicrobial resistance is strongly related to inappropriate use of antimicrobial agents
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Defined daily dose

- The DDD is the assumed average maintenance dose per day for a drug used for its main indication in adults
- Rough estimate of consumption and not exact picture of actual use
- DDDs per 1000 inhabitants per day; DDDs per 100 bed-days; DDDs per inhabitant per year

10 DDDs/1000 inhabitants/day

1% of the population can receive certain treatment daily
Outpatient antibiotic consumption accounted for between 85 to 95% of total antibiotic use in 2012 in the European Union, according to European Centre for Disease Prevention and Control (ECDC).
Antibiotic Use in 2015

Source: IMS Health

Antimicrobial Stewardship: Principles and Practice

Center for Disease Dynamics, Economics & Policy (cddep.org)
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What Drives Inappropriate Antibiotic Use in Outpatient Care?

- Patient satisfaction and pressure
- Time constraints
- Diagnostic uncertainty
- Externalized responsibility

http://www.pewtrusts.org/en
Patient satisfaction and pressure

- Patients or their families may expect to get a prescription at an office visit, even when an antibiotic is not necessary. They may wrongly believe that antibiotics can relieve symptoms similar to those they’ve experienced in the past, such as a high fever.

- Antibiotics help them feel better,
- Prevention of potential deterioration of illness,
- Previous successful experience and investment of time and money to consult a doctor.
• In outpatient settings, doctors have limited time to see patients, diagnose their illnesses, and formulate a treatment plan.
• In interviews, physicians often say workload and time pressures contribute to the over-prescription of antibiotics.
Diagnostic uncertainty

- Diagnostic uncertainty is another reason given for inappropriate prescriptions. Patients with viral and bacterial infections often have similar symptoms—congestion, cough, sore throat—making it difficult for physicians to differentiate between the two diagnosis.
Table 2. Sampled Visits With Antibiotics Prescribed and Mean Annual Rate per 1000 Population of Ambulatory Care Visits With Antibiotics Prescribed by Age Group and Diagnosis From the US NAMCS/NHAMCS, 2010-2011

<table>
<thead>
<tr>
<th>Diagnosis*</th>
<th>Age Group, y</th>
<th>0-19</th>
<th>20-64</th>
<th>65+</th>
<th>All Ages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unweighted No. of Sampled Visits With Antibiotics Prescribed</td>
<td>Weighted Mean Annual Rate of Visits With Antibiotics Prescribed, % (95% CI)^a</td>
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<td>Unweighted No. of Sampled Visits With Antibiotics Prescribed</td>
</tr>
<tr>
<td>Sinusitis^2</td>
<td>657</td>
<td>65 (51-79)</td>
<td>1055</td>
<td>55 (45-64)</td>
<td>151</td>
</tr>
<tr>
<td>Suppurative otitis media</td>
<td>1660</td>
<td>154 (131-177)</td>
<td>305</td>
<td>9 (7-11)</td>
<td>23</td>
</tr>
<tr>
<td>Pharyngitis</td>
<td>1001</td>
<td>91 (76-105)</td>
<td>785</td>
<td>29 (23-35)</td>
<td>39</td>
</tr>
<tr>
<td>Strep, catarrhalis, and miscellaneous infections</td>
<td>570</td>
<td>39 (32-46)</td>
<td>1493</td>
<td>39 (33-44)</td>
<td>230</td>
</tr>
<tr>
<td>Other skin, catarrhalis, and miscellaneous conditions</td>
<td>957</td>
<td>37 (30-43)</td>
<td>1321</td>
<td>32 (25-39)</td>
<td>384</td>
</tr>
<tr>
<td>Urinary tract infections</td>
<td>436</td>
<td>23 (17-28)</td>
<td>1465</td>
<td>35 (30-41)</td>
<td>459</td>
</tr>
<tr>
<td>Vaginal upper respiratory tract infections</td>
<td>589</td>
<td>42 (31-51)</td>
<td>321</td>
<td>19 (13-23)</td>
<td>79</td>
</tr>
<tr>
<td>Bronchitis or bronchiolitis^2</td>
<td>259</td>
<td>28 (28-39)</td>
<td>608</td>
<td>23 (18-28)</td>
<td>140</td>
</tr>
<tr>
<td>Other gastrointestinal conditions</td>
<td>132</td>
<td>9 (5-12)</td>
<td>947</td>
<td>21 (17-25)</td>
<td>85</td>
</tr>
<tr>
<td>Other postoperative conditions</td>
<td>133</td>
<td>8 (5-11)</td>
<td>646</td>
<td>19 (14-23)</td>
<td>144</td>
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<tr>
<td>Miscellaneous bacterial infections</td>
<td>272</td>
<td>20 (15-26)</td>
<td>390</td>
<td>11 (9-13)</td>
<td>40</td>
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<tr>
<td>Other respiratory conditions (eg, chronic bronchitis)</td>
<td>73</td>
<td>10 (6-14)</td>
<td>210</td>
<td>7 (5-9)</td>
<td>117</td>
</tr>
<tr>
<td>Gastrointestinal infections</td>
<td>112</td>
<td>10 (6-13)</td>
<td>423</td>
<td>11 (9-14)</td>
<td>65</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>275</td>
<td>22 (16-27)</td>
<td>219</td>
<td>5 (4-7)</td>
<td>105</td>
</tr>
<tr>
<td>Acne</td>
<td>134</td>
<td>22 (17-27)</td>
<td>119</td>
<td>8 (5-13)</td>
<td>3</td>
</tr>
<tr>
<td>Arthritis or arthritis</td>
<td>135</td>
<td>16 (12-18)</td>
<td>189</td>
<td>8 (6-11)</td>
<td>30</td>
</tr>
<tr>
<td>Miscellaneous nonbacterial infections</td>
<td>23</td>
<td>a</td>
<td>105</td>
<td>3 (1-48)</td>
<td>7</td>
</tr>
<tr>
<td>Nonsuppurative otitis media</td>
<td>81</td>
<td>5 (3-7)</td>
<td>21</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Influenza</td>
<td>5</td>
<td>a</td>
<td>14</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Viral pneumonia</td>
<td>2</td>
<td>a</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Remaining codes not listed elsewhere</td>
<td>784</td>
<td>48 (39-57)</td>
<td>2479</td>
<td>83 (71-95)</td>
<td>936</td>
</tr>
<tr>
<td>All conditions</td>
<td>7510</td>
<td>646 (571-721)</td>
<td>13166</td>
<td>418 (372-464)</td>
<td>3041</td>
</tr>
</tbody>
</table>

Original Investigation
May 3, 2016

Prevalence of Inappropriate Antibiotic Prescriptions Among US Ambulatory Care Visits, 2010-2011

Katherine E. Fleming-Dutra, MD; Adam L. Hersh, MD, PhD; Daniel J. Shapiro; et al

Author Affiliations | Article Information
Acute Respiratory Tract Infections

DDx- Examples

• Acute sore throat
  • Viral/Bacterial
• Pneumonia
• Acute Bronchitis

• Symptoms & Signs
  ±
• CRP- level
  ±
• Rapid antigen tests
Guidelines on management of RTI

• National Guidelines

• European Respiratory Society (ERS)
• European Society for Clinical Microbiology and Infectious Diseases (ESCMID)
• Infectious Disease Society of America (IDSA)
Acute Sore Throat

• Swabbing the throat and testing for GAS pharyngitis by rapid antigen detection test (RADT) and/or culture should be performed (strong, high)

• In children and adolescents, negative RADT tests should be backed up by a throat culture (strong, high)

• Positive RADTs do not necessitate a back-up culture because they are highly specific (strong, high)

• Routine use of back-up throat cultures for those with a negative RADT is not necessary for adults in usual circumstances, (strong, moderate)
Acute Sore Throat

• Testing for GAS pharyngitis usually is not recommended for children or adults with acute pharyngitis with clinical and epidemiological features that strongly suggest a viral etiology (eg, cough, rhinorrhea, hoarseness, and oral ulcers; strong, high).

• Diagnostic studies for GAS pharyngitis are not indicated for children <3 years old because acute rheumatic fever is rare in children <3 years old and the incidence of streptococcal pharyngitis and the classic presentation of streptococcal pharyngitis are uncommon in this age group. Selected children <3 years old who have other risk factors, such as an older sibling with GAS infection, may be considered for testing (strong, moderate).
Acute sore throat

• Follow-up posttreatment throat cultures or RADT are not recommended routinely but may be considered in special circumstances (strong, high).

• Diagnostic testing or empiric treatment of asymptomatic household contacts of patients with acute streptococcal pharyngitis is not routinely recommended (strong, moderate).
Acute sore throat –summary-

• Signs and symptoms of GAS and non-streptococcal pharyngitis usually overlap
• RADT can be useful to distinguish between GAS and non-GAS pharyngitis
  • Fast & Sensitivity: 65-96% Specificity > 96%
  • Missing Group C & G
  • Chronic carrier state
  • Cost of testing

• Throat culture is sensitive up to 95%
  • Gold standard
  • Time consuming

• Molecular tests (PCR-based)
  • High sensitivity & Specificity
  • Expensive
RADT-Turkish Experience-

- Strep-A test is mandatory in Turkey since mid-2016
  - If prescribing antibiotics with Pharyngitis/Tonsillitis diagnosis
- Improvement on antibiotic prescribing?
Misuse of antibiotics

• Non-compliance with therapy: 1/3
• Re-use of leftover antibiotics: 1/4

A systematic review and meta-analysis of misuse of antibiotic therapies in the community

Przemyslaw Kardas\textsuperscript{a}, Scott Devine\textsuperscript{b, *}, Amanda Golembesky\textsuperscript{c}, Craig Roberts\textsuperscript{d}
## Plan

- Primary Healthcare Systems
- Facts about AMR
- Current antibiotic consumption
- Overuse/Underuse/Misuse of antibiotics

## Interventions
AMS

• Systematic measurement and coordinated interventions
  • choice,
  • dosing,
  • route,
  • duration of administration
Main Goals of AMS in Primary Care Setting

• Optimizing clinical outcomes without unintended consequences
  • Toxicity
  • Selection of pathogenic organisms such as *Clostridium difficile*
  • The emergence of antibiotic resistance

• Optimizing resource utilization
Interventions to optimize antibiotic use

- Patient/Provider oriented
- Structural/Behavioral

- Persuasive
- Restrictive
Core Elements of Outpatient Antibiotic Stewardship
Initial steps

- Identify
  - High-priority conditions
  - Barriers that may lead antibiotic misuse

- Establish standards for antibiotic prescription
The Partners of AMS in Primary Care

- Acute care hospitals
- Long-term care facilities
- Local health departments
- Health insurance companies
- Health care professional societies
- Community pharmacies and pharmacists
- Local microbiologic laboratories

Antimicrobial Stewardship: Principles and Practice
Core elements of AMS in Primary Care

- Commitment
- Action for policy and practice
- Tracking and reporting
- Education and expertise
Commitment

Education and expertise

Action for policy and practice

Tracking and reporting

• Write and display public commitments in support of antibiotic stewardship
• Identify a single leader to direct antibiotic stewardship activities within a facility
• Include antibiotic stewardship-related duties in position descriptions or job evaluation criteria
• Communicate with all clinic staff members to set patient expectations
• Use evidence-based diagnostic criteria and treatment recommendations
• Use delayed prescribing practices or watchful waiting, when appropriate
• Provide communications skills training for clinicians
• Require explicit written justification in the medical record for non-recommended antibiotic prescribing
• Provide support for clinical decisions for clinicians
• Use call centers, nurse hotlines, or pharmacist consultations as triage systems to prevent unnecessary visits

Core elements of AMS in Primary Care

Antimicrobial Stewardship: Principles and Practice
• Self-evaluate antibiotic prescribing practices
• Participate in continuing medical education and quality improvement activities to track and improve antibiotic prescribing
• Implement at least one antibiotic prescribing tracking and reporting system.
• Assess and share performance on quality measures and established reduction goals addressing appropriate antibiotic prescribing from health care plans and payers.
Core elements of AMS in Primary Care

- Use effective communications strategies to educate patients about when antibiotics are and are not needed
- Educate patients about the potential harms of antibiotic treatment.
- Provide patient education materials
- Provide continuing education activities for clinicians
- Ensure timely access to persons with expertise
Vaccines in AMS

• National Vaccine Advisory Committee:
  • Vaccines as part of antibiotic stewardship
  • Reduce transmission of antibiotic-resistant strains
  • Develop new vaccines to target resistant pathogens
Multifaceted interventions tailored to precise target populations were most likely to have significant effects on prescribing.
“Les antibiotiques c'est pas automatique” (“Antibiotics are not automatic”) Campaign

An educational campaign was initiated for healthcare workers

The public campaign mainly targeted children and their parents, underlining that antibiotic efficacy is endangered by bacterial resistance and it is essential to preserve their efficacy

The French national campaign was associated with a marked reduction of unnecessary antibiotic prescriptions, particularly in children.
The intervention was delivered by specially trained general practitioners acting as peer academic detailers.

The main effects of this study of a prescription peer academic detailing intervention (Rx-PAD) were a decrease in overall prescription rates for antibiotics for acute respiratory tract infections and, in particular, an increased use of the narrow spectrum agent penicillin V when an antibiotic was issued.

Are Interventions & Guidelines effective?
Summary

Vast majority of antibiotic consumption occurs in outpatient setting

Approximately half of outpatient antibiotic prescribing might be inappropriate

Educational interventions are very important in AMS in primary care

Restrictive measures should be used more in outpatient setting

Vaccination can be effective to reduce misuse of antimicrobial drugs

Management with guidelines are effective yet not satisfactory

Interventions to improve antibiotic prescription is effective but need to be tailored to special circumstances

Strong primary care system produces better health outcomes against lower costs
Thank you