

ABSTRACT

Background: In January 2008, the Clinical and Laboratory Standards Institute (CLSI) published new penicillin breakpoints for intravenous (IV) treatment of *Streptococcus pneumoniae* (pneumococcus) infections--one for meningitis and one for nonmeningitis infections. With this change, many more non-CNS isolates will be reported as susceptible to penicillin, reducing the need for broader spectrum agents that are more likely to promote healthcare-associated infections.

Objective: We asked infectious disease consultants whether the change in breakpoints will translate into increased use of penicillin for treatment of pneumococcal infections and identified barriers to the use of IV penicillin in the treatment of pneumococcal disease.

Methods: In October 2008, the IDSA Emerging Infections Network (EIN) distributed an electronic survey to its 1247 members. The survey was emailed 3 times over 3 weeks. Respondents indicating they do not see patients with pneumococcal infections were excluded from the analysis (N=59).

Results: Of 529 respondents who saw patients with pneumococcal infections (47.2% response rate), 418 (79%) were aware of the breakpoint change. The most common methods of learning about the change were an IDSA News article (n=273, 52%), clinical microbiology laboratory susceptibility reports (n=138, 26%) and communication with colleagues (n=128, 24%). Among 314 (59%) respondents reporting infrequent IV penicillin use for patients with susceptible nonmeningitis pneumococcal infections before the breakpoint change, 150 (48%) were unlikely to increase penicillin use after the change. The most commonly reported barriers to IV penicillin use included the frequent IV penicillin dosing schedule (n=257, 49%), patients already switched to oral antibiotics (n= 216, 41%) and the convenience of continuing treatment with empiric regimens (n=96, 18%). Respondents reported the most common reasons non-ID referring physicians do not use IV penicillin were clinical improvement on initial regimen (n=341, 64%), convenience of continuing empiric regimens (n=247, 47%), and difficulties in understanding susceptibility results (n=220, 41%). Among 324 (61%) respondents whose clinical microbiology laboratories report separate susceptibilities for meningitis and nonmeningitis pneumococcal isolates (as recommended by CLSI), 28 (9%) respondents rated these laboratory interpretations as confusing. IV penicillin use has been encouraged at the institutional level according to 80 (15%) respondents.

Conclusions: IDSA News articles are effective methods for increasing awareness of breakpoint changes among ID physicians. However, barriers to IV penicillin use exist and increasing awareness of breakpoint changes alone may be insufficient to increase penicillin use. A large majority of clinical micro labs have not adopted recommended reporting practices. A combination of strategies including education and improved susceptibility reporting may decrease confusion and increase IV penicillin use among non-ID physicians.



Barriers to Intravenous Penicillin Use for Treatment of Nonmeningitis Pneumococcal Disease: Results of an Emerging Infections Network Survey

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INTRODUCTION

- Original penicillin breakpoints for pneumococcus were based on achievable penicillin concentrations in CSF. However, penicillin achieves greater concentrations in the lungs and blood relative to CSF.¹
- New penicillin breakpoints for nonmeningitis pneumococcal infections were published by CLSI in January 2008.²
- Fewer nonmeningitis pneumococcal infections are now categorized as penicillin nonsusceptible.³
- Increased penicillin use might reduce the need for broader spectrum antibiotics associated with healthcare-associated infections, e.g., antibiotic resistant gram-negatives, *Clostridium difficile*, etc.
- Other than an IDSA News article⁴ and an updated package insert for IV penicillin,⁵ the breakpoint change has not been widely publicized.
- IDSA and SHEA guidelines for antimicrobial stewardship programs recommend using culture results to streamline or de-escalate empiric antimicrobial therapy to more effectively target the causative pathogen, decrease antimicrobial exposure, and decrease costs.⁶
- Compliance with passive dissemination of antimicrobial stewardship guidelines is inconsistent, resulting in a need to identify strategies for improved targeting of antimicrobial therapy based on susceptibility results.

OBJECTIVES

- Identify better methods to communicate changes in antimicrobial breakpoints to clinicians
- Evaluate whether new CLSI breakpoints will result in increased IV penicillin prescribing over broader spectrum antibiotics
- Identify barriers to the use of penicillin for treating pneumococcal disease

METHODS

- The Emerging Infections Network (EIN) is comprised of 1247 adult and pediatric infectious disease consultants belonging to IDSA or Pediatric Infectious Diseases Society.
- In October 2008, 10 months following publication of the new penicillin breakpoints, a 1-page introduction and 1-page questionnaire was distributed via e-mail or facsimile to EIN members.
- The survey was re-sent twice to non-responders over 3 weeks.
- Denominators for certain questions varied as not all EIN members responded to all questions.
- Data was analyzed using SAS version 9.2.



RESULTS

- Of the 529 respondents, >20% were not aware of the breakpoint change at the time of the survey.
- IDSA News reports, clinical microbiology laboratories, and discussions with colleagues were the most common mechanisms for learning about breakpoint changes.
- IDSA News reports, clinical microbiology laboratories, and CLSI documents were the preferred mechanisms for learning about changes.



- Approximately 50% of respondents were more likely to use penicillin as a result of the breakpoint change.
- 11% of respondents believed that non-ID referring physicians would be more likely to use penicillin as a result of the breakpoint change.



- Most commonly reported barriers to IV penicillin use among ID clinician respondents:
- frequent penicillin dosing schedule
- practice of switching patients from IV to oral antibiotics before susceptibility results are available
 Most commonly reported barriers for non-ID referring physicians
- Most commonly reported barriers for non-ID referring physicians
- Clinical improvement on the initial regimen
- Convenience of continuing empiric regimens



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- Among 324 (61%) respondents whose clinical microbiology laboratories report separate susceptibilities for meningitis and nonmeningitis pneumococcal isolates (as recommended by CLSI), 28 (9%) respondents rated these laboratory interpretations as confusing.
- IV penicillin use has been encouraged at the institutional level according to 80 (15%) respondents.

CONCLUSIONS

- Awareness among ID physicians about the 2008 penicillin breakpoint change was low.
- IDSA News articles are effective methods for increasing awareness of breakpoint changes.
 Communication via clinical microbiology labs and national conferences are additional preferred
- We communication was clinical inclusion of breakpoint changes.
 Standard clinical practices, including a preference for infragment desing regiments and early transit
- Standard clinical practices, including a preference for infrequent dosing regimens and early transition from intravenous to oral antibiotics, are barriers to intravenous penicillin use among ID physicians.
- Increasing awareness of breakpoint changes alone may be insufficient to increase penicillin use.

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