

Guideline-Concordant Therapy Reduces Mortality in Patients with Community-Acquired Pneumonia

Mortensen EM, Restrepo M, Anzueto A, Pugh J. Effects of guideline-concordant antimicrobial therapy on mortality among patients with community-acquired pneumonia. Am J Med 2004;117:726–31.

Study Overview

Objective. To determine if patients who receive guideline-concordant antimicrobial therapy have better outcomes than patients who receive therapy inconsistent with national guidelines.

Design. Retrospective cohort study of chart abstracted data.

Setting and participants. 420 patients with pneumonia admitted to 1 of 2 tertiary care hospitals in San Antonio, TX.

Main outcome measure. 30-Day mortality.

Main results. 323 patients (77%) received antimicrobial therapy consistent with national guidelines (concordant therapy), and 97 patients (23%) received therapy not recommended by national guidelines (nonconcordant therapy). Patients who received nonconcordant therapy were older, more likely to be men, and had more comorbid conditions. They also were sicker at admission, with 33% admitted to the intensive care unit as compared with 15% receiving concordant therapy. Patients who received concordant therapy were much less likely to die than patients who received nonconcordant therapy (6.2% versus 21.7%). When propensity scores were used to adjust for the baseline difference between the 2 groups, patients who received concordant therapy still had lower mortality rates than patients who received nonconcordant treatment. Concordant therapy was associated with lower mortality in every pneumonia severity risk class.

Conclusion. Patients who received guideline-concordant treatment had lower mortality than those who did not. Increased use of concordant therapy is likely to improve outcomes for patients with community-acquired pneumonia.

Commentary

Clinicians are inundated with practice guidelines. While most of them are well-intentioned, few are evidence-based [1]. The Infectious Diseases Society of America and American Thoracic Society guidelines that were studied by the researchers are widely recognized as being of high quality

and based on good clinical data. Understanding whether adherence to these guidelines improves patient outcomes is critical.

A challenge to evaluating the impact of guidelines is taking into account why clinicians sometimes choose not to be concordant with a recommendation. Clinicians may opt out of adherence to a guideline because they have knowledge about a patient's illness that is not easily discernible from the chart but has implications for treatment. For example, for a patient who previously had pneumonia caused by a rare and deadly bacterium (eg, *Pseudomonas aeruginosa*), the physician might choose an unusual antibiotic for treatment. Such patients may be at greater risk of death due to their underlying disease, but in a study such as this, their death may be attributed to the use of a nonconcordant antibiotic.

This issue of "unmeasured" confounders is especially problematic when doing a retrospective study where the chart data may be incomplete and may not adequately capture a patient's severity of illness, as is the case with Mortensen et al. However, they tried to adjust and account for confounders, not only by using multivariable modeling but also by stratifying patients by well-known risk categories [2] to examine how patients fared within each group. They consistently found that patients receiving concordant therapy had better outcomes. Finally, they used propensity scores (a score for likelihood of getting the therapy of interest), another technique to account for confounding. One commonly held misunderstanding is that propensity scores can adequately handle unmeasured confounders. They cannot. However, propensity scores are an efficient way of handling measured confounders.

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So what are we to make of the results in light of the possibility of unmeasured confounding? The most compelling reason to believe the results of the study is the magnitude of the effect. When statistically adjusting for all covariates measured and using propensity scores, the authors still found an odds ratio of 5.7, suggesting a large effect. If there are unmeasured confounders, they are unlikely to account for this large difference in mortality rate. Therefore, while the true difference in mortality between those receiving concordant versus non-concordant treatment may be smaller, a difference does exist.

Applications for Clinical Practice

Mortensen and colleagues have made an important contribution to the study of clinical guidelines. By demonstrating

that adherence to evidence-based guidelines can improve patient outcomes, this study has increased the pressure on clinicians and quality managers to ensure that all patients receive appropriate treatment.

—Review by Ashish K. Jha, MD, MPH

References

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