Can serum procalcitonin be used to direct antibiotic therapy in outpatients with acute respiratory infections?

Evidence-based answer
Yes. In the outpatient management of acute respiratory infections, serum procalcitonin use reduces patient exposure to antibiotics without any decrease in treatment success (SOR: A, consistent RCTs).

Evidence summary
A 2011 RCT (N=172) compared procalcitonin-directed antibiotic therapy with current guideline therapy in adult outpatients with community-acquired pneumonia (CAP). Antibiotics were recommended if serum procalcitonin was >0.25 µg/L, discouraged if ≤0.25 µg/L, and strongly discouraged if <0.1 µg/L. In the intervention groups, where antibiotics were withheld, serum procalcitonin was repeated in 6 to 24 hours. If this repeat value was above threshold (procalcitonin >0.25 µg/L) or had doubled, the patient was treated with antibiotics.

No difference was noted in treatment success between the procalcitonin-directed and guideline-directed groups (85% vs 89%; between-group absolute difference −3.7; 95% CI, −14 to 6.7). However, a significant decrease was found in both prescription of antibiotics (84% vs 98%; P=.004) as well as antibiotic exposure (risk ratio [RR] 0.55; 95% CI, 0.51–0.6) in the procalcitonin-directed group.¹

A 2008 outpatient, multicenter, noninferiority RCT (N=458) compared the clinical outcomes of adult patients (mean age 45 years) treated with procalcitonin-directed antibiotic therapy versus standard therapy.² Similar to the preceding study, patients in whom antibiotics were withheld had a repeat serum procalcitonin performed in 6 to 24 hours and if above threshold or doubled, were treated with antibiotics.

The procalcitonin group had a 72% (95% CI, 66%–78%) reduction in antibiotic prescriptions, without a change in treatment
success at 4 weeks (OR 1; 95% CI, 0.7–1.5). In this group, final diagnoses were acute bronchitis (25%), rhinosinusitis (22%), acute pharyngitis (18%), CAP (16%), common cold (5.6%), and COPD exacerbation (5.2%).

A 2010 outpatient, noninferiority RCT (N=550) compared outcomes of adult patients treated with procalcitonin-guided therapy versus controls. Patients were evaluated by primary care physicians and the provider recommended a treatment plan. Serum procalcitonin was then measured and if levels were ≥0.25 µg/L, antibiotics were recommended and if <0.25 µg/L, antibiotics were discouraged. This information was provided to the prescribing physician and the final treatment plan was made, with the ability to override decision based on clinical judgment.

Procalcitonin-guided treatment decreased antibiotic prescriptions from 37% in the control group to 22% in the procalcitonin group (P=.0005). Interestingly, none of the patients in the study group were recommended to receive antibiotics by procalcitonin guidelines. No difference was noted in duration of symptoms or time lost from work.

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REFERENCES

Letter to the Editor

Compounded vancomycin solution for *Clostridium difficile* infection

In the April 2015 issue of *Evidence-Based Practice*, Braun and Works provided a concise review of *Clostridium difficile* infection (CDI) treatment. The authors incorporated a patient-centered consideration of cost and weighed available evidence against current clinical practice guidelines. However, additional cost information may have altered their final recommendation. The cost referenced for oral vancomycin ($2,030) was representative of a course of vancomycin capsules. A less expensive approach that displays similar efficacy is to compound an oral solution from vials of vancomycin powder for injection. A 2014 narrative review of the economics of treating CDI reported similar costs for compounded vancomycin solution and metronidazole capsules ($24–$33 vs $18–$25).

A 2015 retrospective, observational cohort study compared vancomycin solution to vancomycin capsules for the treatment of initial episode severe CDI. Both formulations were dosed at 125 mg 4 times daily for 10 days. Seventy-six patients were included in the analysis of time to CDI cure, defined as diarrhea resolution for 48 hours without complications. The median time to clinical cure observed for the solution and capsules was similar in both groups (8 vs 7 days, P=.597). There was also no difference in clinical cure rates by day 10 of treatment (64% vs 59%, P=.664). Complication rates were similar in both groups.

Vancomycin is the accepted first-line option for severe CDI, but cost considerations have led to guideline recommendations favoring metronidazole in mild to moderate CDI. Compounded vancomycin solution displays comparable safety and efficacy to vancomycin capsules in the treatment of CDI, but at a drastically lower cost. It may be reasonable to consider vancomycin solution, where available, for the treatment of mild-moderate CDI as well.

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