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American Journal of Emergency Medicine 2016-06-01, Volume 34, Issue 6, Pages 957-962
Failure of Outpatient antibiotics among patients hospitalized for acute bacterial skin infections: What is the clinical relevance?

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Soft tissue skin infections are a very common presenting complaint for ED physicians. Patients who present after apparent outpatient treatment failure are very frequently admitted due to the difficulty of determining treatment failure. Many of these patients have multiple comorbidities compounding the problem. The Infectious Diseases Society of America (IDSA) classify outpatient treatment failure of soft tissue skin infections as severe infections. The IDSA recommends broad spectrum antibiotics that cover both gram-positive and gram-negative organisms. The authors of this retrospective cohort study looked at the clinical relevance of treatment failure. They used a large cohort of patients that were admitted after outpatient therapy to evaluate impact on microbiology, treatment, and clinical outcomes.

Methods

Secondary analysis of a multicenter, retrospective cohort of adults and children hospitalized for cellulitis, abscess, or wound infection.

Authors compared clinical features, laboratory and microbiology findings, antibiotic treatment, and outcomes among patients who received outpatient antibiotics prior to admission and those who did not.

Results

Of 533 patients, 179 (34%) received outpatient antibiotics prior to admission.

Compared with those who did not, patients who received antibiotics prior to admission less frequently had fever (18% vs 26%, $P = .04$) and leukocytosis (33% vs 51%, $P < 0.001$).

In the 202 cases where a microorganism was identified, *Staphylococcus aureus* was more common among those who received antibiotics prior to admission (75% vs 58%, $P = 0.02$), particularly methicillin-resistant *S aureus* (41% vs 27%, $P = 0.049$), whereas aerobic gram-negative bacilli were less common (3% vs 13%, $P = 0.03$).

After hospitalization, clinical failure occurred with similar frequency between the 2 groups (12% vs 11%, $P = 0.73$).

Limitations

Risk of type 1 error due to secondary analysis with multiple comparisons.

Possible alternative reasons for admission.

Did not evaluate the underlying reasons for the apparent lack of response to outpatient therapy.

Study included only patients who were hospitalized for treatment.

Observational study: the observed differences between the groups may have been due to factors other than outpatient antibiotic therapy.

No data on the dose, duration or adherence to antibiotics prescribed prior to admission.

Microbiological data may not be able to be extrapolated to cellulitis.

Discussion

This study highlights the difficulty of soft tissue skin infections and outpatient treatment failure.

Treatment failure is difficult to evaluate for many reasons. Compliance is one of many, but also is the lack of response due to antibiotic failure or just continued inflammation. In the ED when a patient presents and

has no clear improvement it is difficult not to label them as outpatient failure. This study looked at the clinical significance of treatment failure. The results of the study showed patients who were hospitalized after failing outpatient therapy had less severe infections on presentation, and were more likely to have cultures that identified methicillin-resistant Staph aureus (MRSA). The results suggest inpatient therapy can be guided toward MRSA.
