



The Impact of Dermatology Consultations on Antibiotic Usage for Suspected Cases of Cellulitis Presenting to Outpatient Internal Medicine Offices

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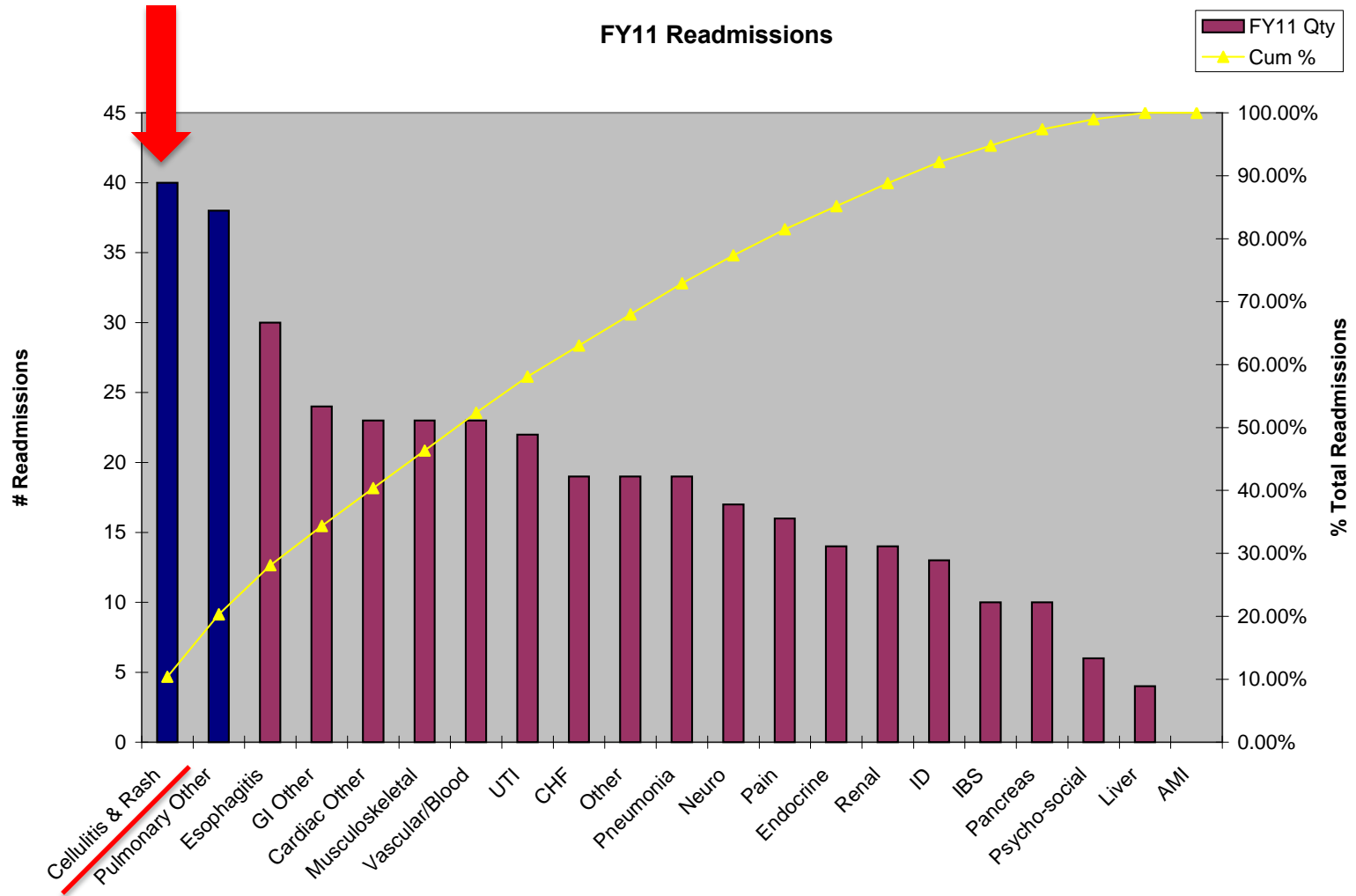
Conflicts of Interest

- No conflicts of interest to disclose

Introduction

- Cellulitis is an acute infection of the dermis and subcutaneous tissue, often complicating skin trauma
 - Annual estimated prevalence of 14.5 million cases and cost of \$3.7 billion dollars.^{1,2}
- There are many conditions that clinically mimic cellulitis, but little research to assess the magnitude of misdiagnosis or addressing ways to correct the problem
 - A prospective analysis of admissions for cellulitis to two major medical centers showed a misdiagnosis rate of 28%.³

Introduction



Hypothesis

- Dermatologist expertise in identification of inflammatory and infectious skin diseases may facilitate accurate diagnosis
 - Dermatologic consult may help identify and treat mimicking conditions → proper treatment

Goal

- **Goal:** determine if a dermatology consultation in the primary care setting could assist in identifying the true diagnosis, altering treatment course
 - Primary objective: measure the rate of antibiotic usage in patients with suspected cellulitis who received a consultation versus those who received standard of care through primary care physician (PCP)

Methods

- Randomized controlled study performed in outpatient internal medicine offices at Massachusetts General Hospital
- **Inclusion criteria:** adult patients with suspected cellulitis as determined by PCP
- **Exclusion criteria:** post-operative site infections, abscesses, human/animal bites, osteomyelitis, hardware/line infections, and pregnant women

Methods

- Intervention
 - On-site dermatology consultation occurring in the offices of PCPs
- Outcomes
 - Hospitalization and antibiotic usage

Treatment Group

- Dermatology attending evaluation → Emergency Department (ED) versus discharged home, antibiotics versus none
 - Outpatient dermatology follow-up in two to five days
- Outpatient follow-up to assess for improvement versus no change versus worsening that requires ED evaluation/antibiotic use versus adverse event
- Patients admitted after either the initial outpatient evaluation or follow-up visit were considered treatment failures

Control Group

- Followed Primary Care recommendations
 - Need for follow-up at the primary care physician's discretion
- Chart review one week later to assess for admission versus discharge, antibiotics versus none
- Patients received a follow-up telephone call to confirm the final outcome of their condition to assess if patients received care outside of our medical records system

Study Protocol

26 Total patients for which PCPs inquired about study enrollment at internal medicine clinics

1 Case excluded
-PCP did not clinically suspect cellulitis

25 Patients enrolled with suspicion for cellulitis by PCP

Study Protocol

25 Total patients
enrolled

16 Patients randomized
to receive a
dermatology
consultation

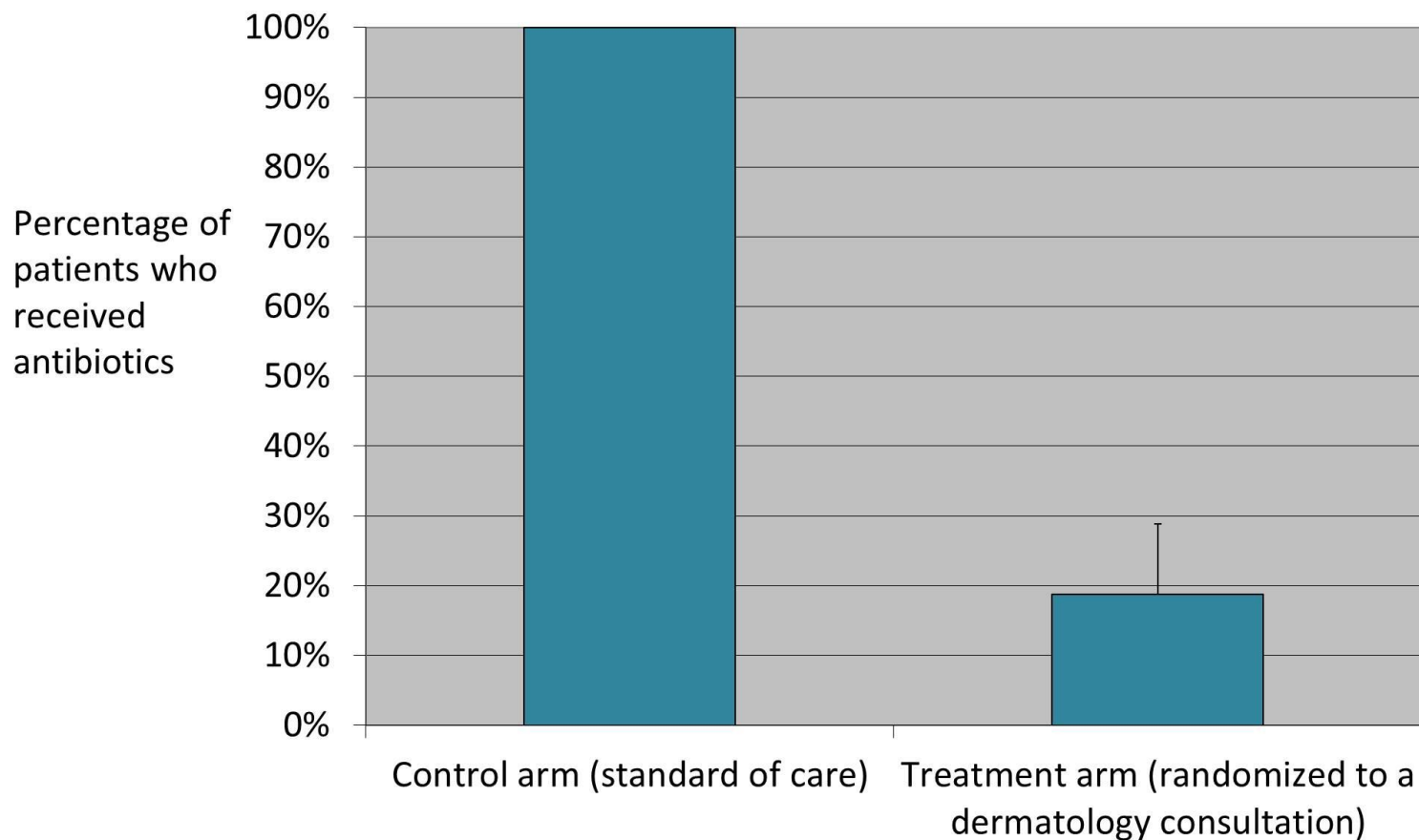
3 Patients received
treatment with
antibiotics

9 Patients randomized to
receive treatment for
cellulitis through PCP

9 Patients received
treatment with
antibiotics for cellulitis

Results

Difference in antibiotic usage between standard of care versus dermatology consultation



Results

- Of the consultation patients three total received antibiotics, only one for true cellulitis
 - Two for erythema migrans
- No patient who received a consultation was hospitalized. One patient was hospitalized in the control arm.

Results

Examples of pseudocellulitis



Results

- List of alternative diagnoses for patients receiving a consultation
 - Stasis dermatitis
 - Contact dermatitis
 - Erythema migrans
 - Arthropod reaction
 - Molluscum contagiosum
 - Gout
 - Eczema
 - Fungal paronychia
 - Phytophotodermatitis

Results

- Apparent discrepancy in PCP and dermatology diagnosis was concerning for potential missed diagnoses between the two groups
- Interim analysis performed prior to original enrollment goal due to concern for missed diagnoses that carry significant morbidity if untreated
- Fisher's exact test, $P < 0.0001$
- Study was stopped

Conclusions

- This study demonstrated a reduction in the rate of antibiotic usage in patients with suspected cellulitis who received a dermatology consultation
 - No adverse events
- Overall hospitalization rate for cellulitis observed in this study was low
 - Suspect that PCP's were not comfortable deferring diagnosis and management in cases of more severe disease
- This study highlights the potential prevalence of conditions that mimic cellulitis and the impact of dermatology consultation on treatment course

Limitations

- Sample size
- Assumes assessment by a dermatologist is the diagnostic “gold standard”
 - One prior prospective study of cellulitis confirmed accuracy of dermatologist evaluation³
- Potential bias: the dermatology consultations were performed by the principal investigator of the study
 - Likely balanced by close monitoring for adverse events, readmission, and treatment failure at follow-up

Next Steps

- Similar study in progress evaluating the role of dermatology consultations for patients admitted for cellulitis
- Hospital administration is now establishing a model of care to involve dermatology input in outpatient cases of cellulitis

The Dermatology Foundation

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career.**



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