Critical Review Form
Therapy

PGY-3

Babbel D, Sutton J, Rose R, Yarbrough P, Spivak ES. Application of the DRIP Score at a Veterans Affairs Hospital. Antimicrob Agents Chemother. 2018 Feb 23;62(3). pii: e02277-17.

Objectives: **"to examine the effect of adoption of the DRIP [Drug-Resistance in Pneumonia] score on broad-spectrum antibiotic use at the Salt Lake City Veterans Affairs Medical Center (VAMC), an academically affiliated VAMC supervised by a hospitalist service and an active antimicrobial stewardship program (ASP)." (p. 1)**

Methods: **This retrospective chart review included patients seen between March 2016 and February 2017 at the Salt Lake City VAMC in Salt Lake City, Utah. Patients with an ICD-10 diagnosis of pneumonia who received antibiotics were included. All patients had data collected including DRIP score criteria, healthcare-associated pneumonia (HCAP) criteria, antibiotics received, microbiology results, acute severity of illness measures, and outcomes. The authors compared actual antibiotics selections with potential changes based on the DRIP score, using a cutoff of $\geq$ 4 for use of broad-spectrum antibiotics.**

A total of 170 patients were included in the analysis. The mean age was 73 years and 99% were males. Nearly a quarter of patients were admitted to the ICU and 7% were intubated. Forty-five patients (26.5%) had a DRIP score $\geq$ 4. A drug-resistant pathogen (DRP) was identified in 3 patients (2%).

Guide		Comments
I.	**Are the results valid?**	
A.	**Did experimental and control groups begin the study with a similar prognosis?**	
1.	Were patients randomized?	No. This was a retrospective chart review and patients were not randomized to any group, but were treated at clinician discretion.
2.	Was allocation concealed? In other words, was it possible to subvert the randomization process to ensure that a patient would be "randomized" to a particular group?	N/A
3.	Were patients analyzed in the groups to which they were randomized?	There were no actual treatment and control groups; instead, the authors chose to examine the theoretical effects of applying the DRIP score and HCAP criteria to patients admitted to the hospital for pneumonia to see how these rule would affect antibiotic administration.
4.	Were patients in the treatment and	N/A.

	control groups similar with respect to known prognostic factors?	
B.	**Did experimental and control groups retain a similar prognosis after the study started?**	
1.	Were patients aware of group allocation?	N/A. Theoretically, patients would have been aware of the antibiotics they were receiving, but would not have understood how this would affect them. More specifically, as the main outcome being addressed was purely theoretical, any knowledge they would have had would have been irrelevant.
2.	Were clinicians aware of group allocation?	N/A. Again, patients were not allocated to separate groups; rather, the theoretical effect of their DRIP scores and HCAP criteria were studied to determine how these would theoretically influence antibiotic administration.
3.	Were outcome assessors aware of group allocation?	N/A. There does not appear to have been any blinding of investigators to antibiotics received or clinical findings (DRIP score, HCAP criteria), but as this study was purely theoretical it seems unlikely that this would have affected the results.
4.	Was follow-up complete?	
II.	**What are the results ?**	
1.	How large was the treatment effect?	• Among the patients who had a DRP isolated, all three fulfilled one or more HCAP criteria and two of three had a DRIP score ≥ 4. • A total of 28 patients received broad spectrum antibiotics; use of a DRIP score ≥ 4 as a determinant would have led to 45 total patients receiving broad-spectrum antibiotics, a 49% increase. However, use of the HCAP criteria would have led to 82 patients receiving broad-spectrum antibiotics. • Comparing patients with a DRIP score ≥ 4 who received community-acquire pneumonia antibiotics with those who received broad-spectrum antibiotics, the authors report no difference in in-hospital mortality, 30-day mortality, 30-day readmission, 30-day pneumonia retreatment, or hospital length of stay.
2.	How precise was the estimate of the treatment effect?	The authors did not provide measures of precision (95% confidence intervals) and provided insufficient data to calculate these. The

		study was rather small with small numbers of outcomes, and appears underpowered to detect significant differences in some of the reported outcomes.
III.	**How can I apply the results to patient care?**	
1.	Were the study patients similar to my patient?	No. This study was conducted a VA hostpital and the resulting cohort of patients was older, almost entirely male, and had very high rates of concomitant pulmonary disease (external validity).
2.	Were all clinically important outcomes considered?	Not really. The authors primarily looked at theoretical changes in antibiotic administration; while they did look at other important outcomes (mortality, length of stay, retreatment), the sample size appears to have been too small to detect potentially clinically significant differences in these outcomes.
3.	Are the likely treatment benefits worth the potential harm and costs?	Uncertain. This was a letter to the editor, an informal presentation of findings from the experience at a single VA hospital. This was not published research, and these findings should be viewed in the context of the larger body of evidence.

Limitations:

1. **As this was an informal chart review and not a published trial, key pieces of information are understandably missing:**
    a. **Details regarding the chart review methods were not provided (Gilbert 1996 and Worster 2004).**
    b. **Formal inclusion and exclusion criteria were not provided, including specific ICD-10 codes used to identify patients.**
2. **The authors defined broad-spectrum antibiotics as use of antipseudomonal beta-lactams, but did not consider MRSA coverage (which may have affected the results).**
3. **The sample size was small and hence underpowered to detect significant differences in outcomes (e.g. 35% vs 16% 30-day mortality for high DRIP score patients not receiving and receiving broad-spectrum antibiotics).**
4. **Given that this chart review was conducted in a VA hospital, it is not surprising that the cohort was older and was almost entirely male (external validity).**

Bottom Line:

This letter to the editor detailing the theoretical effects of the DRIP score on antibiotic prescribing at a single VA hospital suggests that there would have been a 49% increase in antipseudomonal antibiotic administration when compared to actual practice; a much larger theoretical increase would have been seen if HCAP criteria had been used. As this was not published research there were many flaws in reporting and methodology that limit our ability to incorporate these findings into our practice.