Association between Inappropriate Empiric Therapy (IET) and 30-Day Emergency Department/Inpatient (ED/IP) Visits Among Adult Outpatients (OPs) with Complicated Urinary Tract Infections (cUTIs)

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Research

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Background

- Deleterious outcomes associated with IET are well documented among hospitalized patients with infections.
- Scant data exist on the consequences of IET among adult OPs with cUTIs.
- This study evaluated the association between receipt of IET and 30-day ED/IP visits among adult OPs with cUTIs.

Methods

- Retrospective cohort study among Kaiser Permanente Southern California members from 2017-20.
- Inclusion criteria were age ≥18 years; cUTI diagnosis during an OP visit; positive urine culture with antibiotic (AB) susceptibility results; receipt of AB ±3 days of index urine culture; and not hospitalized on day of OP visit. For OPs with multiple cUTIs, only the index cUTI was considered.
- IET was defined as failure to receive an AB with in vitro microbiologic activity per culture and sensitivity report against all recovered cUTI pathogens ±3 days of culture collection date.
- Outcomes included all-cause and cUTI-related ED/IP visits ≥3 days to ≤30 days from index culture date.
- Logistic regression was used to adjust for baseline differences between appropriateness groups.
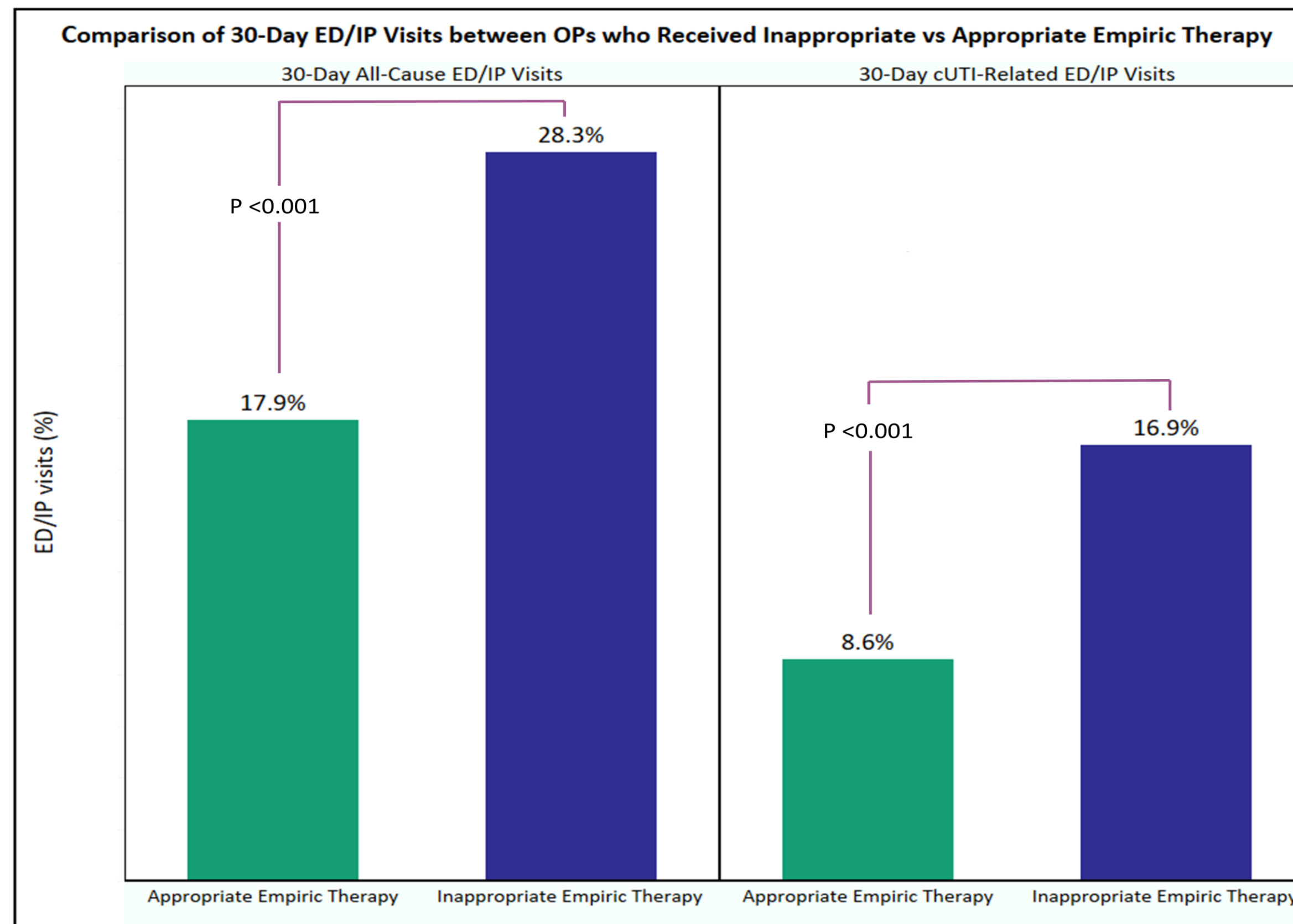
Results

- During the study period, 25,980 OPs with cUTIs met the study criteria.
- IET was noted in 2656 (10%) of patients.
- Comparison of baseline characteristics between appropriateness groups is shown in **Table**.
- Comparison of 30-day all-cause and cUTI-related ED/IP visits between IET and appropriate empiric therapy (AET) is shown in **Figure**.
- In the logistic regression, receipt of IET was associated with an increase odds of 30-day all-cause ED/IP visits (adjusted odds ratio (aOR)= 1.3; 95% CI: 1.2-1.4) and 30-day cUTI-related ED/IP visits (aOR=1.5; 95% CI: 1.4-1.7).

Conclusions

Thirty-day all-cause and cUTI-related ED/IP visits were significantly higher among adult OPs with cUTI who received IET.

As culture and susceptibility results are frequently unknown at the time of empiric therapy selection, the findings highlight the critical need to use institution-specific antibiotic resistance risk stratification tools, in tandem with rapid diagnostic tests, to guide empiric antibiotic decisions among OPs with cUTIs as measures to ensure patients receive AET and maximize chances of a successful clinical outcome.

Figure.

Comparison of 30-Day ED/IP Visits between OPs who Received Inappropriate vs Appropriate Empiric Therapy

30-Day All-Cause ED/IP Visits: Appropriate Empiric Therapy 17.9%, Inappropriate Empiric Therapy 28.3%, P <0.001

30-Day cUTI-Related ED/IP Visits: Appropriate Empiric Therapy 8.6%, Inappropriate Empiric Therapy 16.9%, P <0.001

Table. Baseline Characteristics Between Patients with cUTI Receiving Appropriate and Inappropriate Empiric Therapy

Covariates	Appropriate (N=23,324) n (%)	Inappropriate (N=2656) n (%)
Mean (SD) age	59.2 (20.1)	67.6 (18.0)
Female sex	13,799 (59.2)	1097 (41.3)
Charlson Score Category in the 12 months prior to index culture		
0	8684 (37.2)	572 (21.5)
1-2	6806 (29.2)	665 (25.0)
3-4	3565 (15.3)	566 (21.3)
5+	4269 (18.3)	853 (32.1)
Outpatient care setting at index culture		
Ambulatory (office visit and urgent care)	12,412 (53.2)	1423 (53.6)
ED	8804 (37.7)	929 (35.0)
Virtual care	2108 (9.0)	304 (11.4)
Presence of urinary tract instruments/devices 30 days prior to index culture	2492 (10.7)	586 (22.1)
Cumulative number of prior antibiotics in 90 days prior to index culture		
0	14,433 (61.9)	1068 (40.2)
1	4386 (18.8)	525 (19.8)
2-3	2988 (12.8)	610 (23.0)
4+	1517 (6.5)	453 (17.1)
UTI events in the 12 months prior to index culture	10,519 (45.1)	1674 (63.0)
IP visits in the 12 months prior to index culture	4559 (19.5)	975 (36.7)
ED visits in the 12 months prior to index culture	10,113 (43.4)	1617 (60.9)
Long term care in the 12 months prior to the index culture	974 (4.2)	282 (10.6)

Limitations

- Limitations include those inherent to the study design, including study selection bias, confounding, and confounding by indication.
- It is well established that many patients who receive IET have more resistant infections, and patients with resistant infections tend to be sicker and have a worse prognosis independent of the treatment received.
- Although logistic regression was used to minimize the influence of potential systematic errors, the observed differences in outcomes may have been, in part, a function of unmeasured baseline differences between groups.