Association Between End-of-Treatment Procalcitonin Levels with Mortality & Recurrent Ventilator-Associated Pneumonia

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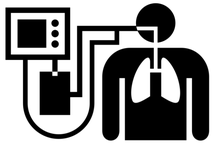
Introduction



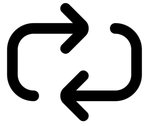
- In the only randomized controlled trial using procalcitonin in ventilator-associated pneumonia (VAP), 30% of patients failed to normalize procalcitonin levels by end of treatment.
- The relationship between end-of-treatment procalcitonin (EOT-P) and VAP recurrence – which affects up to 40% of patients with VAP – has never been examined.
- We evaluated the association between work-life balance satisfaction for practicing urologists who have children under the age of 18 years compared to those who do not.

Methods

Study Population:

- Single center retrospective cohort study of adult patients with VAP had serum procalcitonin levels obtained within 48h after antibiotic completion (AC).
- VAP definition: invasive mechanical ventilation for ≥ 2d, positive respiratory culture, and treatment for ≥ 5d with pneumonia-specific antibiotics.
- Exclusion: death or hospice within 48h of AC.

Outcomes of Interest:



- The primary outcome was a composite endpoint of recurrent pneumonia (defined as clinical suspicion sufficient to warrant respiratory culture collection) and/or death within 30d of AC.

Results

Table 1: Patient Characteristics

Demographics	EOT-P <0.5 (N=79)	EOT-P >0.5 (N=61)	p-value
Age, years (mean, SD)	55.3 (18.8)	55.3 (17.0)	0.99
Male sex (N, %)	50 (63.3%)	35 (57.4%)	0.49
White race (N, %)	51 (64.5%)	43 (70.5%)	0.47
Comorbidities			
Charlson Comorbidity Score (mean, SD)	5.6 (5.0)	7.0 (4.1)	0.08
Cerebrovascular Disease (N, %)	35 (44.3%)	18 (29.5%)	0.08
Chronic Pulmonary Disease (N, %)	31 (39.2%)	26 (42.6%)	0.73
Immunocompromised (N, %)	22 (27.6%)	20 (32.8%)	0.58
Malignancy (N, %)	12 (15.2%)	13.1%)	0.81
Renal disease (N, %)	16 (20.3%)	33 (54.1%)	0.01
Tracheostomy (N, %)	27 (34.2%)	27 (44.3%)	0.29
Severity of illness/healthcare exposures			
Number of inpatient days prior to culture (median, IQR)	5 (3, 12)	10 (5, 16)	0.004
Treatment length days (median, IQR)	8 (6, 12)	10 (8, 17)	0.004
Vasopressor requirement on antibiotic start (N, %)	48 (60.8%)	43 (70.5%)	0.8

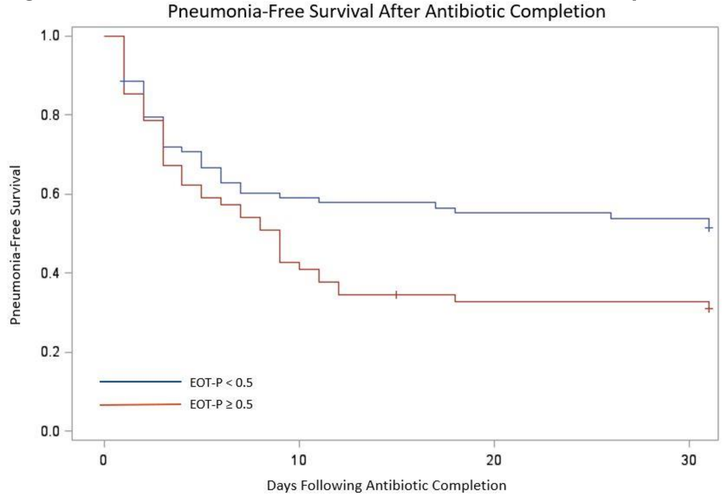
Table 2: Outcomes

Outcome	EOT-P <0.5 (N=79)	EOT-P>0.5 (N=61)	p-value
Death or recurrent VAP within 30 days (N, %)	38 (48.1%)	41 (68.9%)	0.02
Mortality (N, %)	5 (6.33%)	14 (23.0%)	0.006
Recurrent pneumonia (N, %)	36 (45.6%)	36 (59.0%)	0.13

- Patients with elevated EOT-P were more likely to have renal disease, longer duration of abx treatment, and longer hospital length of stay.
- After multivariable logistic regression incorporating renal disease, number of inpatient days prior to respiratory culture, and treatment length of days, patients with elevated EOT-P were significantly more likely to have recurrent pneumonia or death within 30d (adjusted OR 2.37, 95% CI 1.09-5.17).

Results

Figure 1: Pneumonia-Free Survival After Antibiotic Completion



Conclusion

- **Elevated end-of-treatment procalcitonin levels in VAP were independently associated with increased VAP recurrence or mortality within 30d.**
- **Use of end-of-treatment procalcitonin in VAP may serve as a candidate biomarker to predict VAP recurrence.**

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