Performing timely blood cultures for infectious patients is associated with shorter duration of therapy and reduced length of stay

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BLOOD CULTURES' EFFECT ON LENGTH OF STAY

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STUDY PERIOD:
2009-2013

IV ANTIBIOTICS:
> 2 DAYS

AGE: ≥ 18 years

PATIENTS:
n = 2997

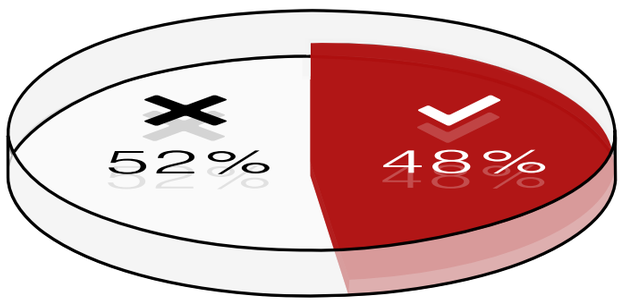
INTRODUCTION

Performing blood cultures is essential for appropriate antimicrobial therapy and mentioned in most guidelines on severe infections, but several studies show that guideline adherence is rather poor[1-4]. This jeopardizes quality of care and increases the risk for resistance development. However, the impact of blood cultures has not been evaluated so far. We therefore analyze the effect of blood cultures on length of stay (LOS) and duration of therapy in patients receiving intravenous (IV) antibiotics on admission.

MATERIAL & METHODS

Setting: University Medical Center Groningen, 1339-bed academic tertiary referral hospital
Antibiotics use: top ten prescribed non-prophylactic antibiotics in 2009-2013 (soon extended to 2016)
Antibiotic start: on admission (±1 day)
Exclusion: patients under 18 years, heamatology and oto-rhino-laryngology wards
Statistics: Log-rank test, multiple logistic regression and Cox regression analysis

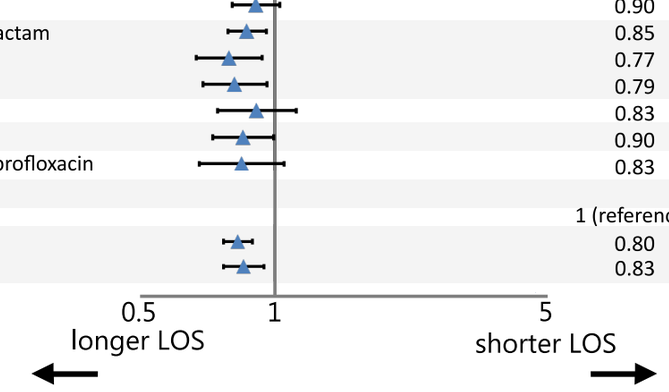
BLOOD CULTURE PERFORMED ?



PRELIMINARY FINDINGS

Cox regression on lenght of stay

Factor	HR	p-value
Age	0.99	<0.001
Sex	0.86	<0.001
Blood cultures	1.11	0.011
Leucocytes	0.86	0.006
Weekend admission	1.20	<0.001
Admission to the hospital		<0.001
via ER	1 (reference)	
via GP	0.99	0.824
via out-patient clinic	0.84	0.031
via unknown route	0.87	0.285
via transfer	0.57	<0.001
Type of antibiotic		0.011
Co-amoxiclav	1 (reference)	
Cefuroxime	0.97	0.626
Ceftriaxon	0.90	0.130
Piperacillin/Tazobactam	0.85	0.005
Ciprofloxacin	0.77	0.007
Clindamycin	0.79	0.016
Amoxicillin	0.83	0.328
Meropenem	0.90	0.043
Co-amoxiclav + Ciprofloxacin	0.83	0.128
Medical specialty		<0.001
Surgery	1 (reference)	
Internal medicine	0.80	<0.001
Other	0.83	0.003

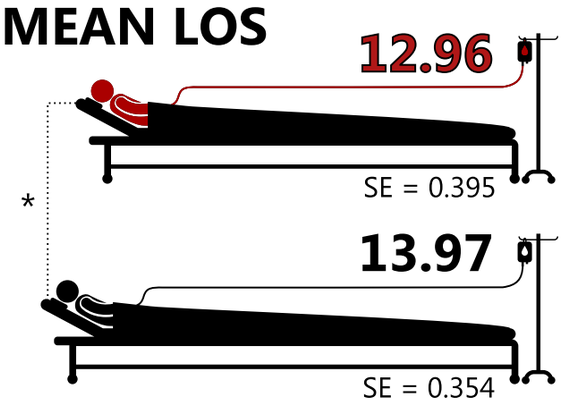


- Association with likelihood for taking blood cultures in odds ratios (OR): Measuring CRP: OR = 8.13 (p<0.001)& measuring leucocytes: OR = 0.52 (p=0.064): adjustement see above
- Total duration of antibiotic therapy: 9.8 vs. 11.0 days (p=0.030)
- Total consumption in DDDs: 18.01 vs. 20.46 (p=0.915)

PRELIMINARY CONCLUSION

Patients with (timely) blood cultures performed had a significantly shorter duration of therapy and LOS. Increasing the compliance with existing guidelines for drawing blood cultures prior to starting antibiotic therapy is most likely a useful intervention to improve quality of patient care and patient safety. These data underline the importance of an integrated, multidisciplinary approach in antimicrobial, infection prevention and diagnostic stewardship (AID)[5].

MEAN LOS



* log rank test: p < 0.017

REFERENCES

1) Rhodes A. et al. Intensive Care Med 2017, 43:304-377.
2) Abu Omar Y. et al. Eur J Cardiothorac Surg 2017, 51:10-29.
3) Reissig A. et al. Lung 2013, 191:239-246.
4) Chia D. et al. Am J Med Qual 2014, 30:539-542.
5) Dik J.-W. et al. Future Microbiol 2015, 11:93-102.

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