

Bloodstream infection on the emergency department: a retrospective study on the effect of time to initiate antibiotic treatment on length of stay and cost of hospitalization

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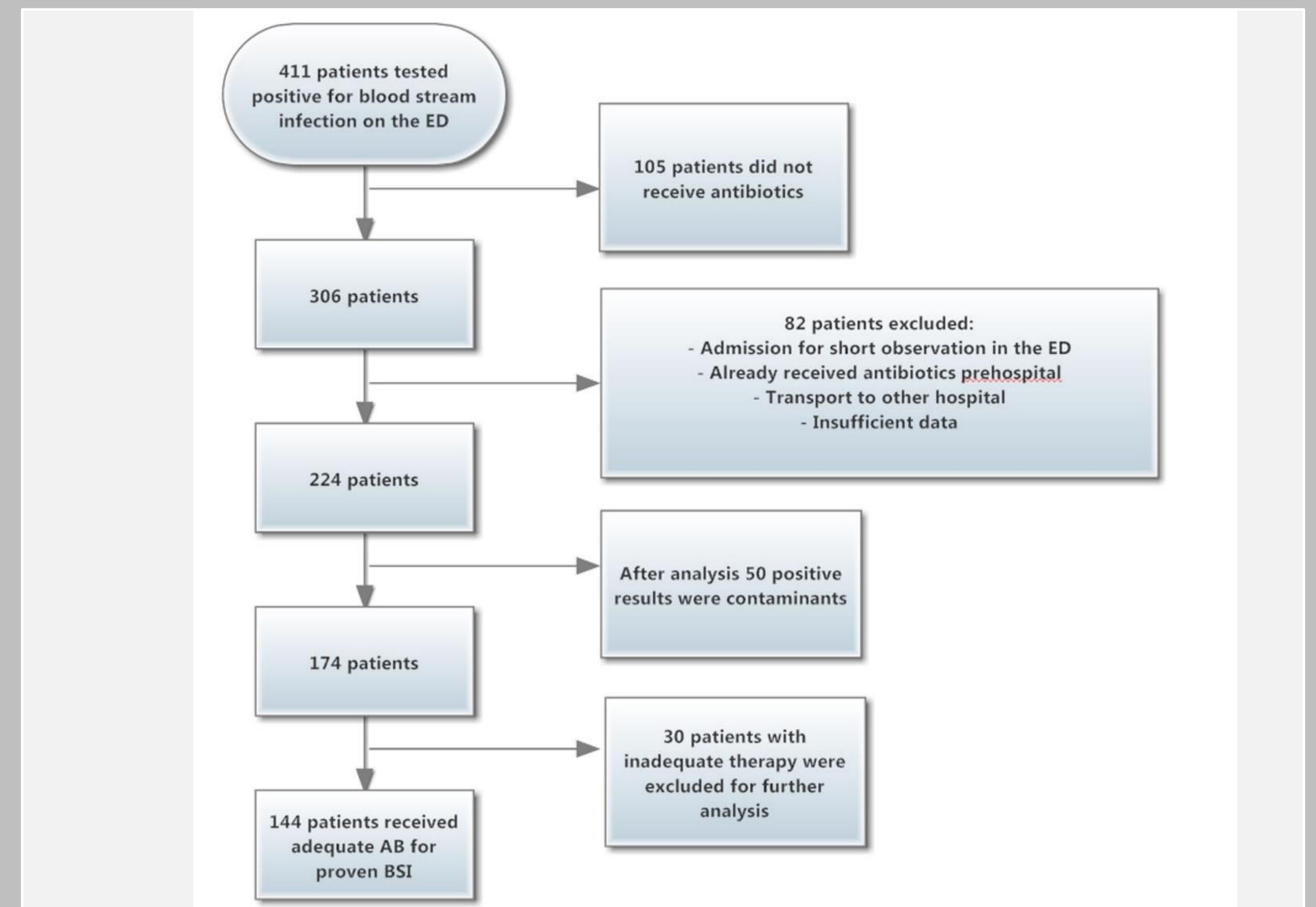
Introduction

A considerable amount of admissions through the emergency department (ED) involve infectious problems and in particular bloodstream infections (BSI). For BSI there are no guidelines concerning initiation of therapy within a certain timeframe. The objective was to analyze the effects of time to initiation of antibiotics in patients with BSI on the ED on length of stay in-hospital (LOS IH) and cost of hospitalization. Finding a significant effect would suggest a higher scoring for these patients in the frequently used triage systems.

Methods

Data were retrospectively collected from patients of an urban hospital during a one year period. Patients were included when they received appropriate antibiotics on the ED for BSI (defined by ≥ 1 positive blood culture). Empirical antibiotic regimen was considered as appropriate when initial therapy administered on the ED comprised at least one antibiotic that was marked as effective on *in vitro* studies. Clinical relevance of each pathogen was discussed with a clinical microbiologist based on the patients' records and pathology, after which contaminants were excluded. Patients were excluded when they were discharged after short observation in the ED, received prehospital antibiotics, were transported to another hospital, or in case of insufficient data.

Statistical analyses were performed by multiple linear regression of the continuous variables and logistic regression of the binary variables.

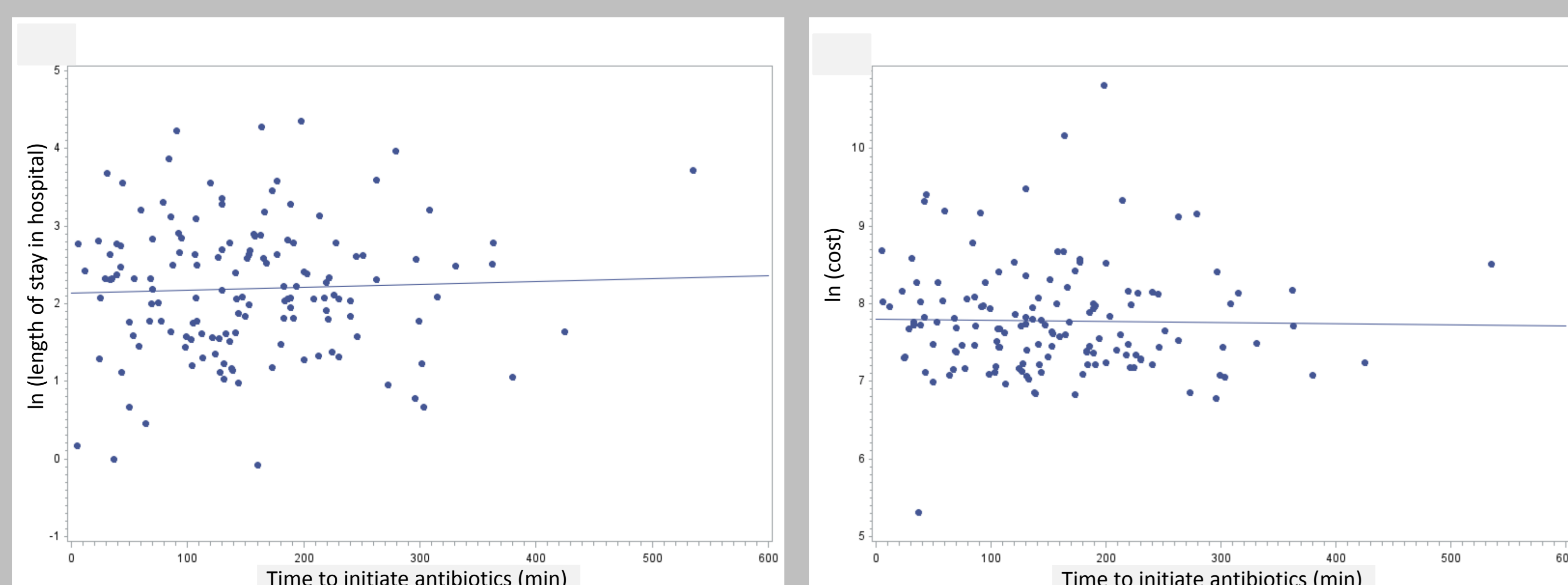


| Patient characteristics | BSI infections (n=144) No. (%) |
|-----------------------------------|--------------------------------------|
| Demographic information | |
| Mean Age (years) \pm SD | 68 \pm 17 |
| Male sex | 69 (48) |
| Severity index scores | |
| <i>Apache II</i> | |
| 0-6 | 30 (21) |
| 7-9 | 41 (28) |
| 10-12 | 34 (24) |
| 13-26 | 39 (27) |
| <i>Pitt bacteremia score</i> | |
| 0 | 91 (63) |
| 1 | 23 (16) |
| 2 | 23 (16) |
| ≥ 3 | 7 (5) |
| <i>Charlson comorbidity index</i> | |
| 0 | 42 (29) |
| 1 | 27 (19) |
| 2 | 30 (21) |
| ≥ 3 | 45 (31) |
| Disposition | |
| Geriatrics | 39 (27) |
| Urology-Nephrology | 22 (15) |
| Oncology | 20 (14) |
| Intensive care unit | 17 (12) |
| Pneumology | 16 (11) |

Table 1. Demographics, severity index scores and disposition of the studied patients (n=144).

| Primary site of infection | n=144 No. (%) |
|---|------------------|
| Urinary | 47 (33) |
| Respiratory | 37 (26) |
| Abdominal | 20 (14) |
| Soft tissue | 17 (12) |
| Central nervous system | 6 (4) |
| Cathetersepsis | 3 (2) |
| Unknown | 14 (10) |
| Pathogen isolates | |
| n=144 No. (%) | |
| E. coli | 48 (33) |
| S. pneumoniae | 26 (18) |
| S. aureus | 10 (7) |
| P. mirabilis | 6 (4) |
| S. agalactiae | 5 (3) |
| Bacteroides fragilis, E. faecalis, K. oxytoca, K. pneumonia, P. aeruginosa, S. epidermidis, S. dysgalactiae | 3 (2) |
| Antibiotic regimen | |
| n=167 Frequency of administration (%) | |
| Amoxicillin-clavulanic acid | 79 (47) |
| Ciprofloxacin | 19 (11) |
| Amikacin | 13 (8) |
| Cefepim | 12 (7) |
| Ceftriaxon | 8 (5) |
| Flucloxacillin | 4 (2) |

Table 2. Most frequently encountered primary sites of infection, isolated pathogens and administered antibiotic regimens.



Results

A total of 144 cases were reviewed. Average LOS IH was 13 days (SD \pm 13) and the average cost per case was 3345 euros (SD \pm 4920).

In this study the average time to initiate antibiotics was 2 hours 33 minutes (SD \pm 91min). After controlling for age, sex, pathogens, sites of infection and three different evaluation scores (Pitt score, Charlson index and APACHE II score) no significant correlation could be found between the time within which antibiotics were administered and LOS IH (P = 0.5239), nor the cost of hospitalization (P = 0.3072).

Conclusion

Our study could not demonstrate that a more rapid administration of appropriate antibiotics leads to shorter stay in-hospital, nor lower cost of hospitalization, but future studies are warranted with larger patient groups. Presumably not only patients with severe sepsis benefit from appropriate therapy in a timely manner.

References

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