Antibiotic prescribing for E coli bacteraemia: retrospective audit

Paul McKendrick, Lucy Reville, Sharon Irvine, Chris Isles. Medical Unit, Dumfries and Galloway Royal Infirmary, Dumfries DG2 8RX

NHS Dumfries & Galloway

Introduction

Effective antibiotic stewardship is required to treat infections, protect patients from harm caused by unnecessary antibiotic use, and combat antibiotic resistance. Recommended duration of antibiotic treatment for gram negative bacteraemia has traditionally been seven to fourteen days though recent studies have shown that clinical outcomes of shorter (less than or equal to 10 days) courses of antibiotic treatments were not inferior to longer (greater than 10 days) treatments (Tansarli et al).

Aims

Against this background we undertook a retrospective audit of antibiotic practices in a consecutive series of patients with E coli bacteraemia. Our aims were two fold: first to establish if the correct antibiotic was administered, based on the provisional diagnosis and our hospital's empirical antibiotic guidelines; and second to determine whether the duration of antibiotic therapy was appropriate or unnecessarily prolonged.

Methods

Thirty-five patients presented with E coli bacteraemia between September 2020 and January 2021. We excluded five patients: one was discharged before the result of the blood culture was known and four following an early decision to withdraw active treatment. We reviewed the electronic case notes of the remaining 30 patients to document clinical findings relating to their illness. There were no missing data.

We used our hospital's empirical antibiotic guidelines to determine whether the choice of antibiotic prescribed on admission had been correct and considered that an appropriate duration for antibiotic therapy was 7 days. If the patient had not recovered by day seven then a more prolonged course of antibiotic was felt to be clinically appropriate. However, if the patient had recovered by day seven then a longer course of antibiotic was judged to be clinically unnecessary. For the purposes of the study, 'recovery' was defined as inflammatory markers within normal range and a NEWS of 0.

Figure 1

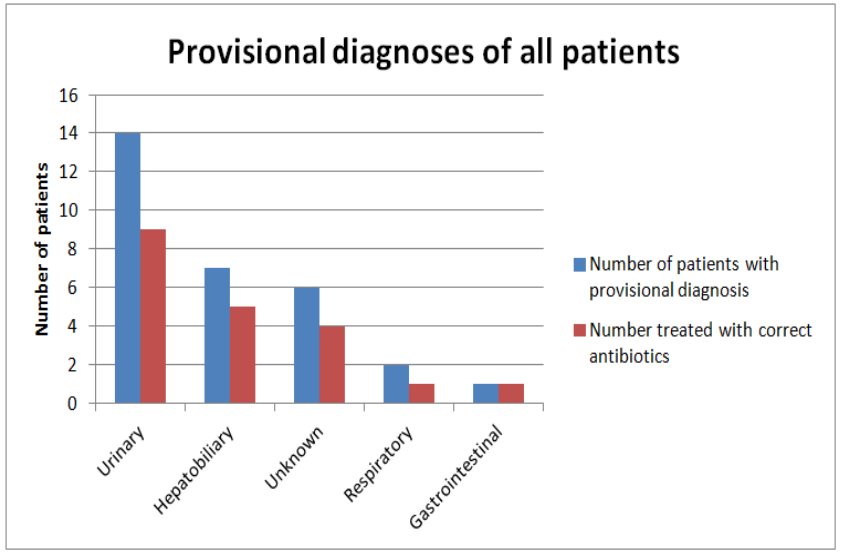
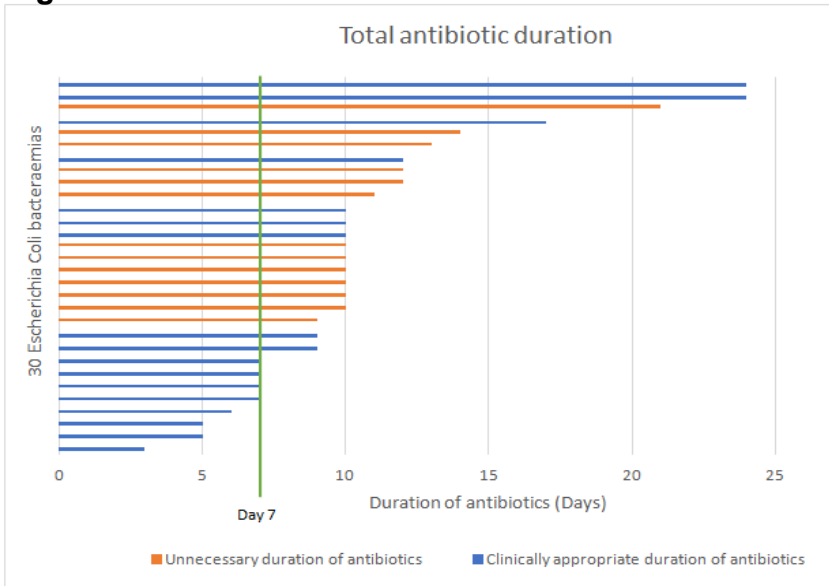


Figure 2



Results

The average age of our 30 patients was 71, range 38-93 years. On the day of admission, the likely source of infection was considered to be urinary (14 patients), hepatobiliary (7), respiratory (2), gastrointestinal (1) and unknown (6) (Fig 1). Five (17%) patients received antibiotics before blood cultures were taken. Twenty patients (67%) were prescribed antibiotics that were in keeping with our hospital's empirical antibiotic guidelines. All patients were given the correct antibiotic once sensitivities were available. Eight (27%) received antibiotic treatment for seven days or less. A longer course of antibiotic was considered appropriate in 9/22 (41%) because they had not recovered and unnecessary in 13 (59%) who had recovered by day 7. Figure 2 shows total antibiotic duration for each patient. The vertical green line represents a target duration of 7 days. The horizontal blue lines indicate patients judged to have received antibiotic for an appropriate length of time while the horizontal orange lines represent patients whose course of antibiotic was considered to be unnecessarily long.

Discussion

We identified three failings of antibiotic stewardship in this audit. One in six patients had antibiotic prescribed before their blood culture was taken, one third were given an initial antibiotic that was not in keeping with our hospital's empirical antibiotic prescribing policy and three fifths of those who received more than 7 days treatment may have done so unnecessarily. While these failings do not appear to have led to measurable adverse outcomes in this small study, they have the potential to cause unnecessary harm to patients and to promote antibiotic resistance. We believe the results of our audit support the need for hospital-wide change in the way in which we prescribe antibiotics for patients with E coli bacteraemia.

Reference

Tansarli et al. A systematic review and meta-analysis of antibiotic treatment duration for bacteraemia due to Esch Coli. Antimicrob Agents Chemother 2019; 63: e02495-18.