

# MP23-12: A Contemporary View of Antibiotic Resistance in Urology in the United Kingdom

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## 1. INTRODUCTION

- Antibiotic resistance is a growing public health concern globally; the rise of extended spectrum beta lactamase (ESBL) producing organisms causing urinary tract infections (UTIs) is well documented
- Subsequent carbapenem resistance is now emerging
- The carriage rate of ESBL in Europe is estimated to be 10%<sup>1</sup>, and a recent large UK study found 7.4% of *Escherichia Coli* UTIs resistant to third generation cephalosporins<sup>2</sup>
- ESBL bacteraemia is associated with increased costs, longer hospital stays, delays in appropriate antimicrobial therapy and higher mortality<sup>3,4</sup>
- ESBL infections pose significant therapeutic challenges as ESBL producers are often associated with resistance to other classes of antimicrobials<sup>5</sup>
- Trends in antibiotic resistance are important in determining both empirical treatment of UTI and prophylaxis for urological procedures
- Antimicrobial therapies should be based on local resistance patterns, thus continuous monitoring of emerging resistance trends is required
- Studies have shown that once antibiotic resistance is established, reduced use of that antibiotic is slow to reduce rates of resistance<sup>6</sup>
- Therefore it is important to act on emerging trends before resistance becomes established

## 2. OBJECTIVES

- Aim to determine the prevalence of ESBL producers and carbapenem resistance across urology patients at Imperial College Healthcare NHS trust
- Examine resistance rates to commonly used antibiotics
- Examine the spectrum of causative organisms within these urology patients
- Use this information to rationalise our antimicrobial regimes

## REFERENCES

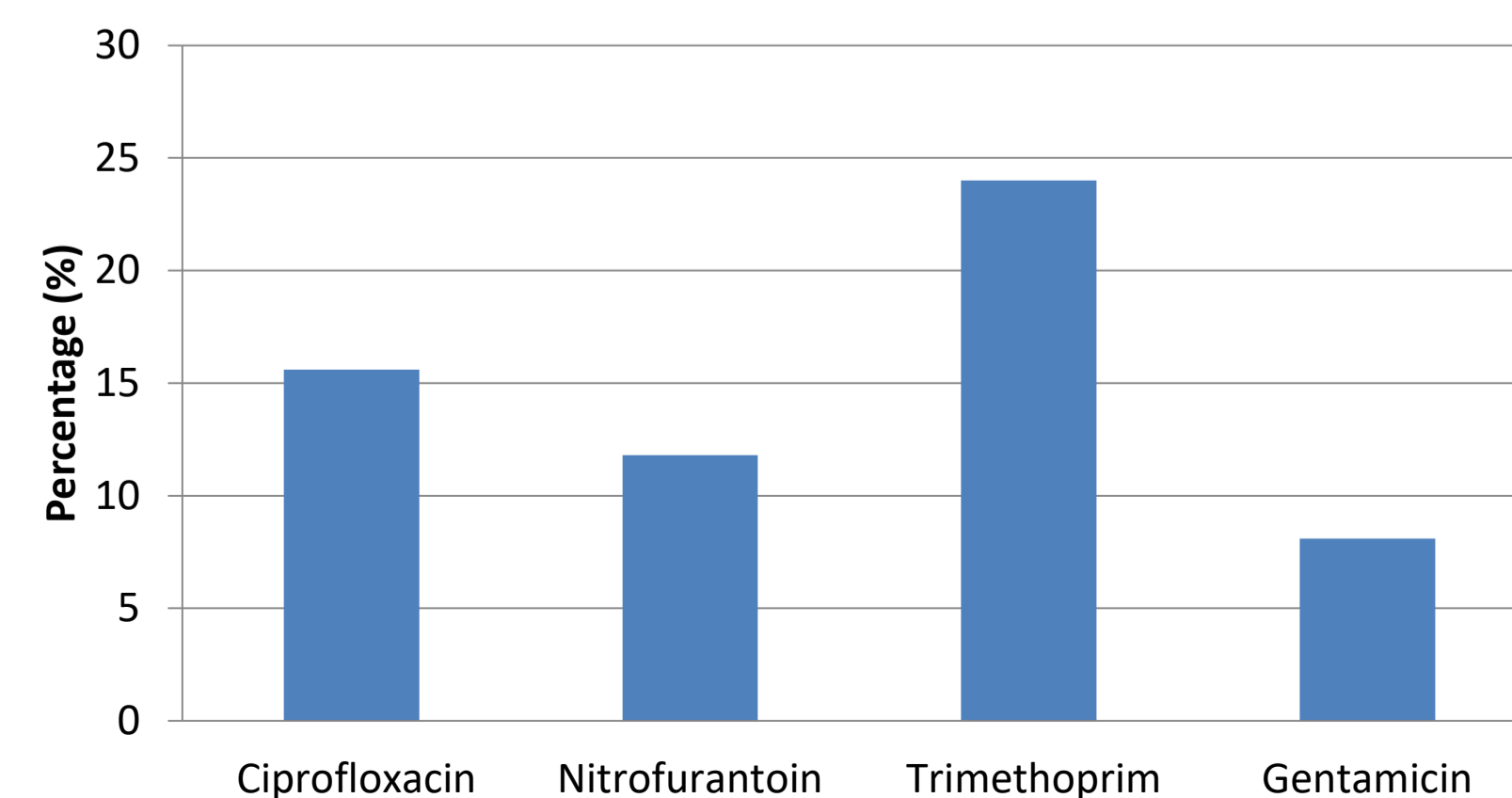
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## 3. METHODS

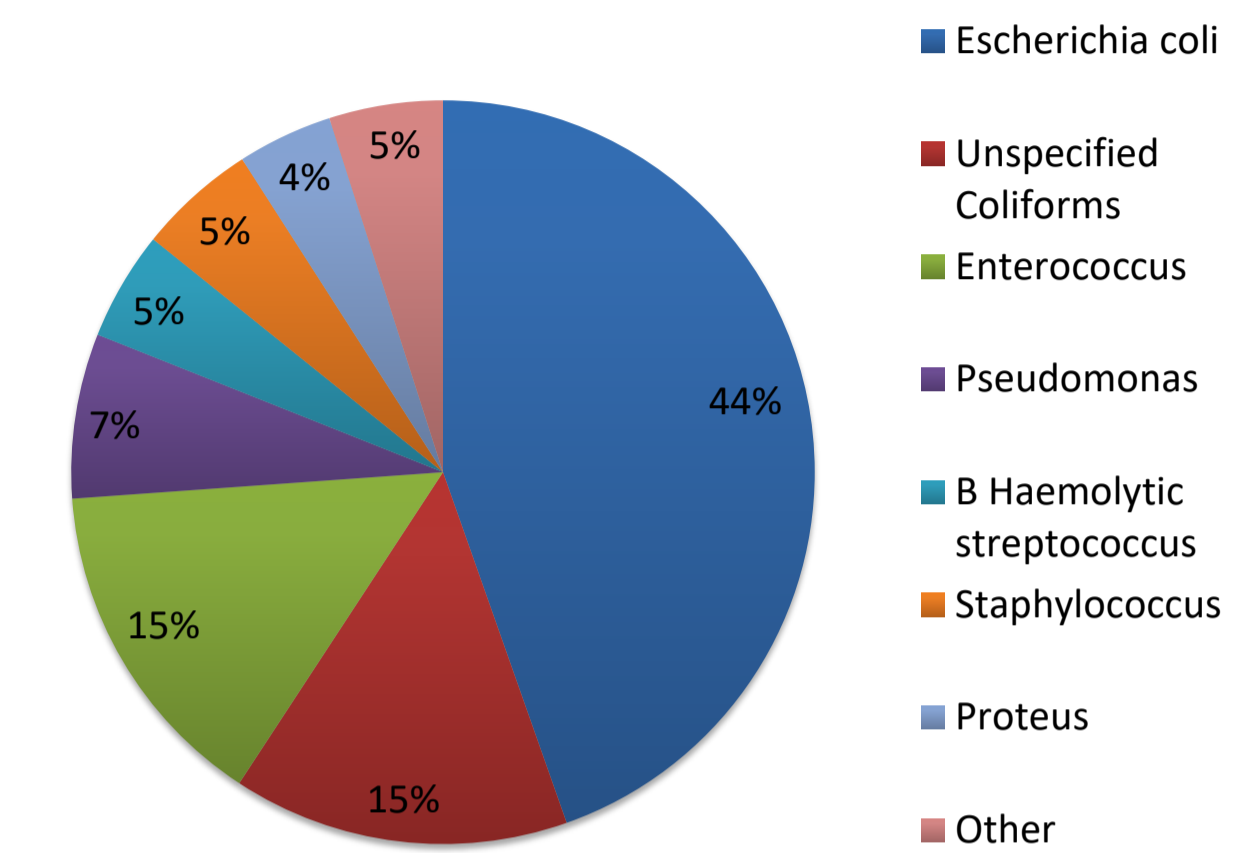
- A database of all positive culture results received by the microbiology laboratory at Imperial College Healthcare NHS trust over a period of eight months between 2016-2017 was reviewed
- The database was filtered to include all positive urine culture results from the urology department, including both in-patients and out-patients
- The resistance rates to commonly used antibiotics in the treatment of UTI were analysed
- In particular, the prevalence of ESBL producers and carbapenem resistance were examined
- Evidence of ESBL production was defined as resistance to ceftazidime, cephalixin or cefotaxime
- Multi drug resistance within the ESBL producers was examined
- Multi drug resistance was defined as resistance to at least one agent in three or more antimicrobial categories<sup>7</sup>
- The spectrum of organisms causing UTI across all urology patients was analysed, as well as the spectrum of organisms identified as ESBL producers

## 4. RESULTS

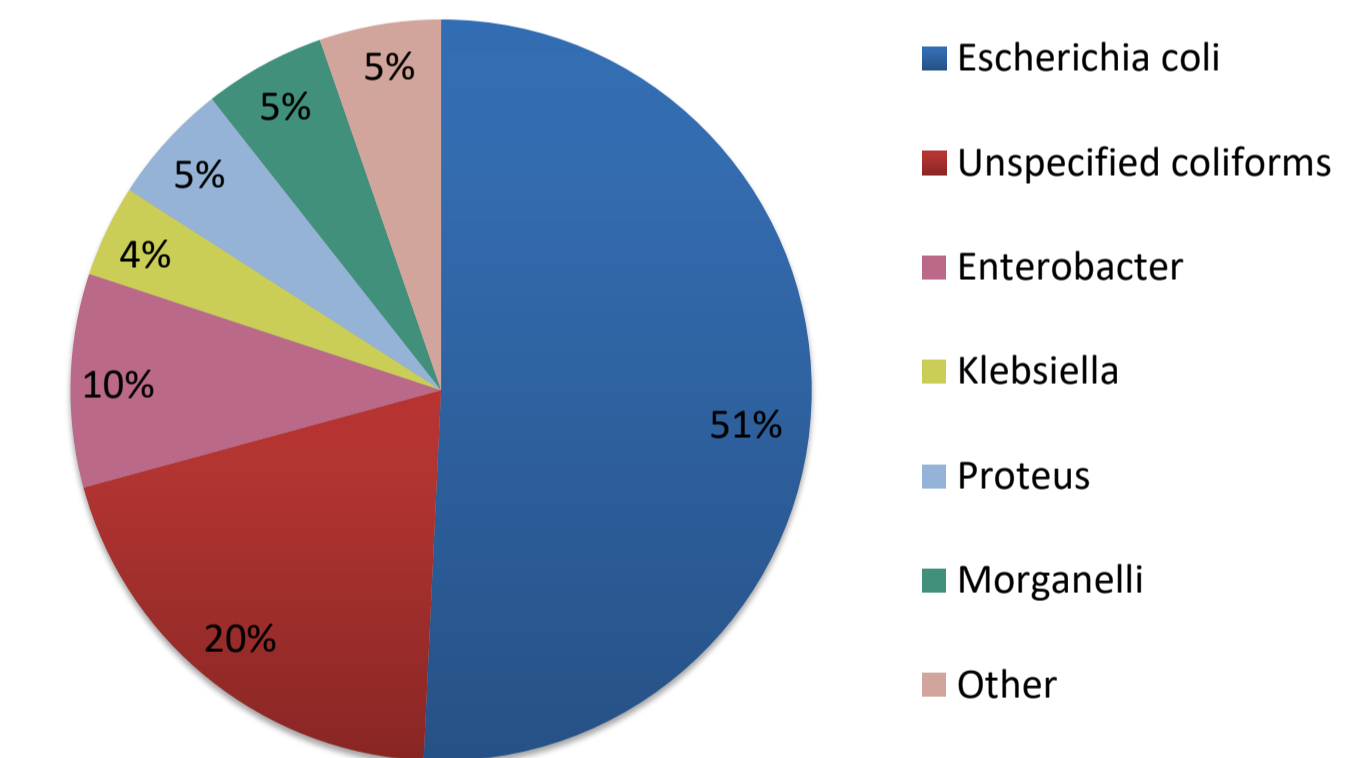
- During the eight month period, the microbiology laboratory cultured 468 positive urine samples from the urology department
- The number of ESBL producers was 75 (16%)
- Of these ESBL producers 78.7% were identified as multi drug resistant
- The number of carbapenem resistant organisms was 4 (0.85%)
- Figure 1 shows the resistance rates to commonly used antibiotics in the treatment of UTIs
- *Escherichia Coli* was found to be the most common causative organism, responsible for 44.2% of all positive urine cultures and accounting for 50.7% of ESBL producers



**Figure 1**  
Graph showing resistance rates to commonly used antibiotics



**Figure 2** Pie chart showing prevalence of causative organisms in all patients



**Figure 3** Pie chart showing prevalence of organisms that were ESBL producers

## 5. CONCLUSIONS

- The prevalence of ESBL across urology patients is significant and of particular concern is the high proportion of these that are multi drug resistant
- The high rates of resistance to commonly used antibiotics are in line with published data from London a decade ago<sup>8</sup>, although the emergence of ESBL is a newer concern
- The study shows carbapenem resistance is present, although currently at low levels within urology patients
- This carbapenem resistance may follow a similar trajectory to that of ESBL in the next few years
- Ongoing surveillance and liaison with the microbiology department to develop antibiotic policies for prophylaxis and empirical treatment of UTI is required to slow this rise in resistance