• Fluoroquinolones (FQs) are commonly prescribed in the inpatient setting, and offer advantages of broad spectrum of activity, good tissue penetration, and convenient dosing [1-2].

• However, with widespread use, antimicrobial resistance to FQs have increased [3]. FQs also carry the risk of serious adverse effects, including tendonopathy, peripheral neuropathy, severe hypoglycemia, mental health side effects, and increased risk of aortic ruptures and tears [4-5].

• In 2016, the FDA advised restricting FQ use for certain uncomplicated infections, where benefits outweigh the risks, and recommended FQs be reserved for patients who have no other treatment options [6].

• In order to identify opportunities for improving antibiotic practices at our facility, we assessed appropriate inpatient quinolone use at University Hospital.

Methods

• We performed a retrospective chart review on inpatients at University Hospital in Newark, New Jersey who received FQs for greater than 48 hours between January 1, 2019, and March 31, 2019.

• We collected data on demographics, comorbidities, penicillin allergy, antibiotic therapy and duration, clinical indication for FQ use, empiric vs targeted therapy, relevant microbiological data and susceptibilities, and new Clostridioides difficile infection after FQ use.

• We assessed appropriate quinolone use, our outcome measure, by clinical guidelines and expert ID/Antimicrobial Stewardship Program (ASP) opinion, and categorized use as either:
  a) Appropriate
  b) Appropriate, but not preferred
  c) Not appropriate by clinical guidelines and expert opinion

Results

• We reviewed 77 charts, 1 patient was readmitted and included twice

• Of these, 58 (75%) of patients were on empiric therapy

• Mean duration of quinolone use was 4.85 days (range 2-40 days)

Table 1: Baseline Demographic and Clinical Factors (n=77)

Baseline Characteristics n (%) Mean Age 53 (range 18-84 y/o)
Male Sex 45 (58)
Hispanic Ethnicity 21 (27)
DM 25 (32)
Advanced Liver Disease 14 (18)
COPD 11 (14)
Malignancy 11 (14)
Immunosuppression 11 (14)

Figure 1: Fluoroquinolone Use (n=77)

Table 2: Infectious indication for Quinolone (n=77)

Infectious Indication n (%) UTI 11 (14)
Complicated UTI 3 (4)
Uncomplicated UTI 8 (10)
SBP (Prophylaxis) 9 (12)
HAP 6 (8)
Intra-abdominal Infection 6 (8)
CAP 4 (5)
Wound Infection 4 (5)
ERCP (Prophylaxis) 4 (5)
VAP 3 (4)
Unknown 3 (4)
Aspiration PNA 2 (3)
Acute COPD Exacerbation 2 (3)
Endocarditis culture negative 1 (1)
Enterocolitis 1 (1)
Infectious Diarrhea 1 (1)
Acute Asthma Exacerbation 1 (1)
ENT flap (Prophylaxis) 1 (1)
Leech therapy (Prophylaxis) 1 (1)

Figure 3: Appropriate Quinolone Use (n=77)

Table 3: Appropriate Quinolone Use by Clinical Indication (n=77)

Infectious Indication Appropriate Appropriate, but Alternative Antibiotic Preferred Not Appropriate UTI n (%) 8 (10) 4 (5) 1 (1)
Complicated UTI n (%) 1 (1) 1 (1) 1 (1)
Uncomplicated UTI n (%) 10 (13) 6 (8) 0
SBP (Prophylaxis) n (%) 3 (4) 5 (6) 2 (2)
HAP n (%) 5 (6) 3 (4) 2 (2)
Intra-abdominal Infection n (%) 2 (3) 1 (1) 1 (1)
CAP n (%) 1 (1) 2 (3) 0
Wound Infection n (%) 1 (1) 0 0
ERCP (Prophylaxis) n (%) 1 (1) 1 (1) 0
VAP n (%) 1 (1) 1 (1) 1 (1)
Aspiration PNA n (%) 1 (1) 0 0
Double Pseudomonas coverage n (%) 1 (1) 0 0
Acute asthma exacerbation n (%) 1 (1) 0 0
Unknown clinical indication n (%) 1 (1) 0 0
Asymptomatic bacteriuria n (%) 1 (1) 0 0

Table 4: Reasons for Inappropriate Quinolone Use (n=77)

Empiric therapy wound infection n (%) 8 (10) 3 (4) 3 (4)
Viral gastroenteritis n (%) 2 (3) 0 1 (1)
Urinary tract infection n (%) 1 (1) 1 (1) 1 (1)
Double Pseudomonas coverage n (%) 1 (1) 0 0
Acute asthma exacerbation n (%) 1 (1) 0 0
Unknown clinical indication n (%) 1 (1) 0 0
Asymptomatic bacteriuria n (%) 1 (1) 0 0

Figure 2: Allergy Breakdown (n=77)

• Adverse Events

• 5 patients developed new Clostridioides difficile infection

• Of these, only 1 received other antibiotics besides a quinolone

• 1 deemed to have appropriate quinolone use

• 3 were deemed to have appropriate quinolone use, but not preferred therapy

Limitations

• Study sample was small with limited time-frame

• This was a retrospective study and data was not collected in a standardized manner

• Appropriateness definition was determined by the ASP team but may differ from clinical judgement/expertise of others

Discussion

• We found that a majority of inpatients were prescribed quinolones that were either not clinically indicated or were prescribed quinolones when other preferable agents were available.

• This study highlights opportunities to improve antibiotic practices and to promote antibiotic stewardship in our facility.

• ASP plans to continue a second phase of this study looking at appropriate quinolone use after providing direct “audit and feedback” to providers to assess pre- and post-intervention quinolone use.

References


