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SARS CoV-2 Dispatches

An evaluation of the five rights antibiotic safety before and during COVID-19 at an NHS Foundation Trust in the United Kingdom

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ABSTRACT

Introduction: Antimicrobial Resistance (AMR) poses a significant global health threat, with AMR-related deaths projected to reach 10 million annually by 2050. The COVID-19 pandemic has further exacerbated this crisis. This study focuses on evaluating the 'Five Rights of Antibiotic Safety' in an NHS Foundation Trust in England, assessing the impact of the COVID-19 pandemic on antibiotic prescribing and Antimicrobial Stewardship (AMS) practices in 2019 and 2020.

Methods: A cross-sectional retrospective study was conducted, focusing on adult patients aged 25 and older admitted to the NHS Foundation Trust and prescribed antibiotics for respiratory tract infections in 2019 and 2020. The study involved a retrospective review of 640 patient records, using descriptive analysis to evaluate the adherence to the 'Five Rights of Antibiotics' and assess the impact of COVID-19 on antibiotic safety practices.

Results: The study observed significant shifts in antibiotic prescribing practices during the study period. There was an increase in instances of inappropriate dosing and route of administration, alongside a slight improvement in prescribing durations. The study also noted a stable rate of appropriate antibiotic selection according to antimicrobial guidelines, indicating a concerning rise in inappropriate prescribing patterns during the COVID-19 pandemic.

Conclusion: The study revealed notable changes in antibiotic prescribing practices during the COVID-19 pandemic, advocating the importance of robust AMS to ensure appropriate use of antibiotics. The findings highlight the need for enhanced AMS educational initiatives and systematic oversight to combat AMR and protect public health in future health crises.

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1. Introduction

By 2050, the annual death toll from multi-drug-resistant infections is projected to reach 10 million. In 2019, Antimicrobial Resistance (AMR) was responsible for 1.2 million deaths [1]. This number, exacerbated by the COVID-19 pandemic, is projected to reach 6 million by 2023. Antimicrobial Stewardship (AMS) advocates for judicious antibiotic use [2]. 'The Five Rights of Antibiotic Safety' ensure appropriate usage. It encompasses the right patient, drug, dose, time, and duration [3]. This study aimed to evaluate antibiotic safety and AMS practices in accordance with the 'Five Rights of Antibiotic Safety' at one English NHS Foundation Trust before and during the COVID-19 pandemic in 2019 and 2020. This evaluation is based on local antimicrobial guidelines ensuring appropri-

ate and right antibiotic use, encompassing the patient, drug, dose, time, and duration.

2. Methods

While it is acknowledged that the COVID-19 pandemic significantly impacted antibiotic safety and AMS activities, there remains limited evidence regarding its precise effects. There was an immediate call for further studies to explore AMS implementation during the pandemic. A cross-sectional retrospective study was conducted, focusing on adult patients aged 25 and older who were admitted to one NHS Foundation Trust in the UK and prescribed antibiotics for respiratory tract infections, including pneumonia and COVID-19, during 2019 and 2020. The study excluded outpatients, individuals hospitalised for less than 48–72 hours, patients not prescribed antibiotics, and children. To ensure diversity, 640 patient records were reviewed using systematic and stratified sampling methods. Descriptive analysis was utilised to evaluate the 5Rs of

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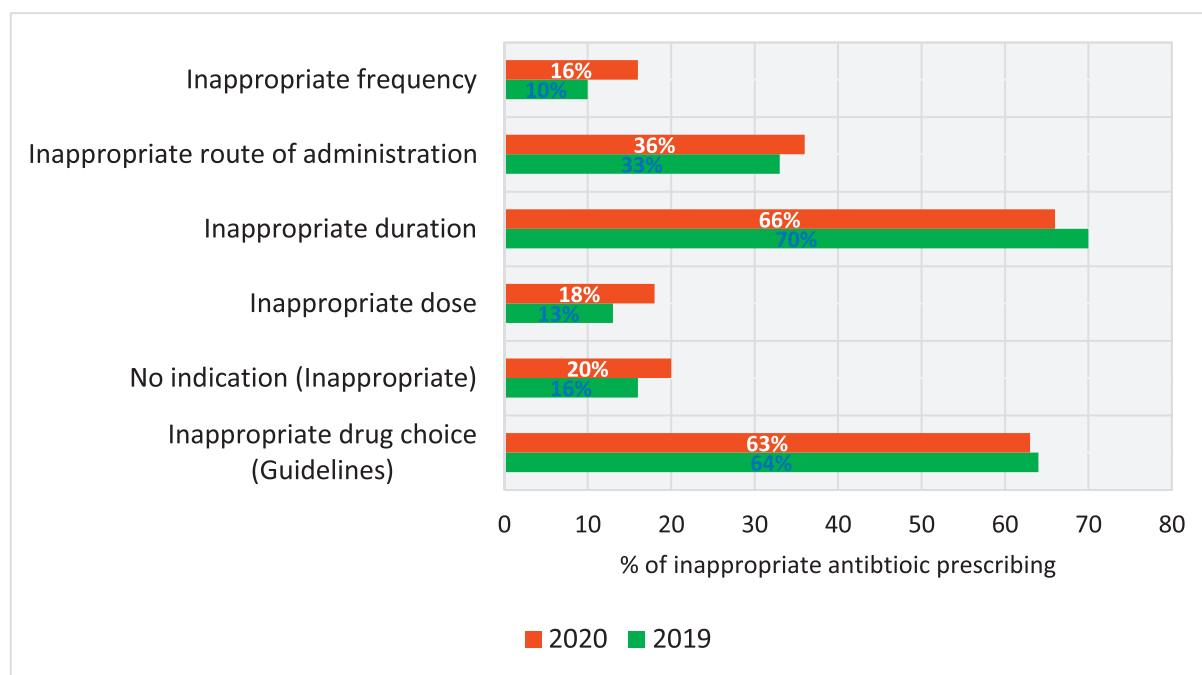


Fig. 1. Proportion of Five Rights of Antibiotic Safety: A comparison of 2019 and 2020 during the COVID-19 pandemic.

antibiotic safety and to assess the impact of COVID-19 on antibiotic safety practices. Data collection utilized a validated tool, and the study was registered in ISRCTN, adhering to WHO criteria (ISRCTN 14825813).

3. Results

In our study, we evaluated adherence to the 'Five Rights of Antibiotics' for the years 2019 and 2020. As illustrated in Fig. 1, there were significant shifts in the proportions of inappropriate antibiotic prescribing during this period. The inappropriate route of antibiotic administration saw a slight increase from 33% in 2019 to 36% in 2020. Similarly, instances of inappropriate dosing rose from 13% in 2019 to 18% in 2020. However, the proportion of inappropriate duration prescriptions showed improvement, decreasing from 70% in 2019 to 66% in 2020. However, prescriptions made without clear indications increased from 16% in 2019 to 20% in 2020.

Interestingly, the selection of the antibiotic, in accordance with antimicrobial guidelines, remained relatively stable, hovering at 63%–64% across both years. These findings highlight a concerning rise in inappropriate antibiotic prescribing patterns, especially during the 2020 COVID-19 pandemic. The results emphasise the critical importance of adhering to the 'Five Rights of Antibiotic Safety'. The observed fluctuations, including the increase in dosing errors by 3%–5% and the reduction in inappropriate durations, combined with steady drug choice rates, highlight the urgent need for oversight or antibiotic review. Moreover, to safeguard antibiotic efficacy, uphold patient wellness, and combat the looming threat of antimicrobial resistance, enlightening AMS educational initiatives in antibiotic prescribing is paramount.

4. Conclusion

The evaluation of antibiotic prescribing adherence to the 'Five Rights of Antibiotics' over 2019 and 2020 in this study revealed

significant shifts, particularly during the COVID-19 pandemic. An increase in prescriptions without clear indications from 16% to 20% highlights potential changes in prescribing behaviour during the pandemic. The pandemic's impact on prescribing practices highlights the urgency of correlating antibiotic consumption with prescribing appropriateness. This necessitates robust AMS to ensure appropriate antibiotic use, combat antimicrobial resistance, and protect patient health against future health crises. Effective AMS is crucial for enhancing patient safety and public health.

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Ethical approval

The study received ethical approval from the University of Hertfordshire ethics committee and Health Research Authority (HRA) (REC reference number 22/EM/0161).

Competing interest

None declared.

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