Trends in Antibiotic Use in a UK Secondary Care Prior to and During the COVID-19 Pandemic: A Cross-Sectional Retrospective Study

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Trends in Antibiotic Use in a UK Secondary Care Prior to and During the COVID-19 Pandemic: A Cross-Sectional Retrospective Study

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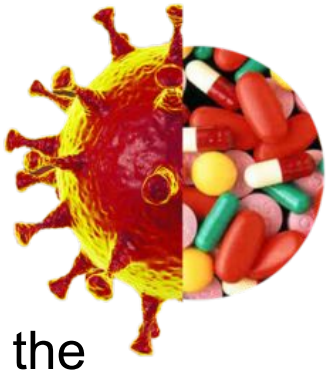
Conflict of Interest

I have no conflict of interest.

Objectives



- Provide an overview of the research background, explaining its significance and the problem it addresses.
- Describe the methodology, including how data was collected and analysed.
- Highlight key findings and their importance in answering the research questions.
- Explain how the findings impact contemporary pharmacy practice and research.
- Discuss future research directions and potential applications of the findings.

Research background

- Antimicrobial resistance (AMR) is a rapidly escalating global health challenge will cause 39 million deaths between 2025 and 2050.
- To address this, the UK Government developed a 5-year action plan, 'Confronting Antimicrobial Resistance 2024 to 2029,' aimed at optimising antimicrobial use.
- The World Health Organisation (WHO) promotes antimicrobial stewardship (AMS) and developed the AWaRe classification system to guide global AMS implementation. The defined daily dose (DDD) standardises antibiotic use comparisons.
- The COVID-19 pandemic significantly impacted health services, particularly in secondary care, potentially exacerbating AMR due to increased antibiotic use.

Aim of the research study

To evaluate changes in antibiotic use in a UK secondary care setting following the onset of the COVID-19 pandemic in 2020 compared to 2019.

Methodology

- This cross-sectional retrospective study evaluated antibiotic use among adults at an NHS Foundation Trust in England.
- It focused on patients with respiratory tract infections (RTIs) and pneumonia in 2019 and 2020.
- Data from 640 patient records were extracted using a WHO AWaRe-based tool.
- Study included adults, immunocompromised, pregnant women, and RTI patients.
- Antibiotic use measured by Defined Daily Dose (DDD).
- Registered under ISRCTN 14825813 with HRA ethical approval.
- Public and patient involvement was ensured through review by the Citizens Senate.

Key findings

- The results show a notable increase in the Defined Daily Dose (DDD) of several antibiotics during the COVID-19 pandemic.
- In the "Access" category, amoxicillin usage rose from 1.33 DDD pre-pandemic to 4.33 DDD in 2020. Co-amoxiclav remained nearly constant at around 15 DDD but showed a marked increase compared to other antibiotics.
- In the "Watch" category, azithromycin increased from 3 to 9 DDD, and clarithromycin from 32 to 35.5 DDD. Levofloxacin usage doubled from 13 to 26 DDD.
- The "Reserve" category showed no significant increase, indicating stable consumption.

Trends in antibiotic use prior to pandemic and during the COVID-19 pandemic (2019 and 2020)

Antibiotic Name	Antibiotic Category	Antibiotics DDD in 2019	Antibiotics DDD in 2020	Trend
Amoxicillin	Access	1.33	4.33	
Co-amoxiclav	Access	15.9	15.2	
Benzylpenicillin	Access	0.45	0.15	
Doxycycline	Access	6	2	
Flucloxacillin	Access	1.13	1.13	
Gentamicin	Access	0	6.67	
Metronidazole	Access	1.8	0.4	
Sulfamethoxazole/trimethoprim	Access	0.25	1.5	
Cephalexin	Access	0	0.5	
Azithromycin	Watch	3	9	
Ceftazidime	Watch	1	0	
Ceftriaxone	Watch	0.5	1	
Ciprofloxacin	Watch	7	9	
Clarithromycin	Watch	32	35.5	
Levofloxacin	Watch	13	28	
Meropenem	Watch	0.67	2	
Piperacillin/tazobactam	Watch	0.32	0.32	
Teicoplanin	Watch	1	1	
Vancomycin	Watch	1.5	1	
Aztreonam	Reserve	0	0.5	
Cefazidime/Azobactam	Reserve	1.67	0	
Linezolid	Reserve	1.05	0.3	

Relevance & impact of findings to contemporary pharmacy practice/research

- The findings highlight the urgent need for robust antimicrobial stewardship to tackle changes in prescribing behaviours during the COVID-19 pandemic.
- This is particularly important due to the increased use of high-risk antibiotics, such as macrolides and levofloxacin.
- These insights emphasise the crucial role of monitoring and optimising antibiotic use in secondary care to improve patient safety and treatment quality.
- They are highly relevant to current pharmacy practice and research, particularly in the fight against antimicrobial resistance.

Future of the presented research

- It is important to provide sustainable and resilient measures to antimicrobial stewardship for long-term effectiveness.
- Future research is essential to ensure the effective implementation of antimicrobial stewardship and appropriate antibiotic prescribing.
- Expanding the antibiotic dashboard to broader healthcare settings will enhance monitoring.
- Integrating real-time data analytics can improve stewardship interventions.
- Predictive models should be developed to anticipate prescribing trends during crises.
- The dashboard’s effectiveness in reducing inappropriate antibiotic use across various settings needs to be assessed.

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THANK YOU!

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