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Pattern of Following Antibiotic Guidelines: The UK and Bangladesh Perspective

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ABSTRACT

Background: The rampant misuse and overuse of antibiotics have made antibiotic-resistant bacteria a global threat to public health. This is a reparable issue that can only be fixed by following accepted antibiotic recommendations. This study aims to evaluate the patterns of prescribed antibiotics between Bangladesh and UK, focusing on gaps from both regions that needs improvement.

Materials and methods: The descriptive study analyzed antibiotic prescribing trends over six months using SPSS 20, based on structured surveys from hospitals in the UK and Bangladesh.

Results: In the UK, a compliance rate of 67.66% was observed, with incorrect decisions at 32.33%. Respiratory Tract Infections (RTI) had the highest number of errors. RTI had the highest incorrect decisions, while bone and joint infections had no errors in the UK. In Bangladesh, a 68.75% compliance rate was found and the incorrect decision rate was 31.25%, with Urinary Tract Infections (UTI) showing the highest errors (33 out of 61 cases). The graph also shows RTI and GI infections had notable incorrect decision rates, while prophylactic decisions had no errors. In comparison Bangladesh had higher error rates for UTI and RTI cases compared to the UK.

Conclusion: The results emphasize the need of antibiotic stewardship programs in Bangladesh. Recommendations for maintaining high adherence rates in the UK includes ongoing education and

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audit. To implement the antibiotic stewardship programs, customized strategies are to be designed based on follow-up and investigations for major issues of each healthcare system in conjunction to global systematic approaches.

Keywords: Antimicrobial Resistance (AMR); Antibiotic Resistance (ABR); World Health Organization (WHO); Antimicrobial Usage (AMU); Antibiotic Stewardship (AS); Multi-Drug Resistant Organisms (MDRO); MRSA (Methicillin-Resistant *Staphylococcus aureus*)

INTRODUCTION

The improper and excessive use of antimicrobials, particularly antibiotics, in humans, animals, and the food chain promotes the rapid emergence of Antimicrobial Resistance (AMR) or Antibiotic Resistance (ABR). This trend of resistant organisms ultimately results in prolonged hospital stay, increased cost burden, treatment failure, substantial illness and complications, and also death. In 2019, about 4.95 million deaths were estimated to be associated with bacterial AMR and 1.27 million deaths were attributable to bacterial AMR [1]. The overuse of antimicrobials in outpatients was also documented in Bangladesh due to both self-medication and physician's prescriptions [2-4].

In the UK, a number of policy interventions and strategies exist to improve the use of antibiotics and a new national action plan has recently been published. This sets a target to reduce UK antimicrobial use in humans by 15% by 2024, including a 25% reduction in antibiotic use in the community from the 2013 baseline. A better understanding of current prescribing patterns is needed to inform appropriate antibiotic stewardship interventions. Primary care settings accounted for 81% of all antibiotics prescribed in England in 2017. A large body of literature focuses on unnecessary antibiotic prescribing for viral infections [5].

In the year 2021, the WHO and other international agencies designated antibiotic resistance as a significant and escalating global public health threat, which significantly impacts the management of infectious diseases. Antibiotic resistance was proclaimed the most significant emerging threat worldwide. To address this issue, Bangladesh developed and approved a national strategy for Antimicrobial Resistance Containment (ARC) through the joint efforts of the National Steering Committee (NSC) and the National Technical Committee (NTC). Additionally, the recommendation was made to create a National Action Plan (NAP) to further combat antibiotic resistance.

The WHO expert committee developed the 'AWaRe' classification on using the Essential Medicine List (EML) in 2017 to support, strengthen, and monitor the antibiotic stewardship program and was further updated in 2021 [6].

The causative microbes of common infectious diseases of Bangladesh are resistant to antibiotics due to lack of standard culture facility, diagnosis and treatment of common infections.

The aim of this study was, firstly, to calculate the rates of antibiotic prescription in UK deviating from the national prescribing guidelines published by the UK Primary care in 2023, based on the type of recorded infection. Secondly, to calculate the rates of antibiotic prescribing tradition in Bangladesh according to the WHO 'AWaRe' classification. Thirdly, to understand the prevalence of AMU, the distribution of antibiotic agents used, to improve AMU knowledge, and to identify the possible scopes of intervention for promoting judicious use of antibiotics utilizing the national guideline.

Objectives

- To measure antibiotic prescribing trend in UK and Bangladesh in primary care according to nationally recommended best practice.
- To identify the rates of potentially inappropriate antibiotic choice in prescriptions for common infections in UK and Bangladesh in general practices.
- To prevent inappropriate use of antibiotic and promote rational use of antibiotics.

MATERIALS AND METHODS

In this study, descriptive statistics were used to assess patterns in prescribing antibiotic maintaining recommended best practice in Bangladesh and the UK. Prescribing practices were studied over a period of 6 months, from April 2024 to September 2024. Indication-based antibiotic prescribing was investigated on random samples from various hospitals in Dhaka, including Dhaka Medical College Hospital, as well as different hospitals in Sylhet, including Sylhet MAG Osmani Medical College, and the United Lincolnshire Healthcare Trust in the UK. A total of 700 cases were included in the study and data analyzed by SPSS 20.

A structured survey questionnaire was designed to assess the extent of antimicrobial prescribing patterns among the hospitalized patients at different wards of survey hospitals. The survey was conducted among in-patients of medicine, surgery and pediatric wards. Study physicians collected the demographic and clinical information of the patients, including indications for antimicrobial use, microbiological lab findings, and details of antimicrobial used. For descriptive analysis, these data were analyzed and illustrated in **Figures 1-6 and Tables 1-2**.

Inclusion Criteria

All admitted patients in the ward were included in the study after obtaining written informed consent from patients or legal attendants.

Exclusion Criteria

Patients from OPD or day-care patient facilities, nursing homes, psychiatric wards, long-term care wards, emergency departments, out-patient dialysis, discharged patients waiting for parents or relatives, and outpatient parenteral antimicrobial therapy, gynaecology and obstetrics wards, CCU, paediatric wards in NHS were excluded from the study.

RESULTS

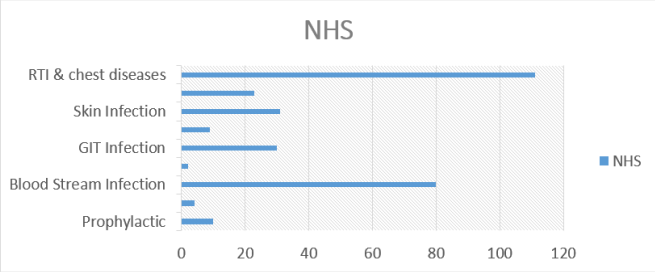

Figure 1: Distribution of infections treated in the NHS across different categories.

This graph shows the distribution of cases across various types of infections within the Trust hospitals data. Here's a detailed interpretation of the results: Respiratory Tract Infections (RTI) and Chest Diseases, this category has the highest number of cases with nearly 120 cases. This suggests that RTI and chest diseases are highly prevalent within the NHS dataset. Blood stream infections rank second with approximately 80 cases, showing a significant frequency of occurrence in the NHS. Gastrointestinal Tract (GIT) Infections account for around 30 cases, making them less frequent than RTI and blood stream infections but still notable. Skin infections are represented by about 20 cases, indicating moderate prevalence within the NHS data. There are a small number of prophylactic cases, fewer than 10, highlighting infrequent use of preventative antibiotic prescriptions.

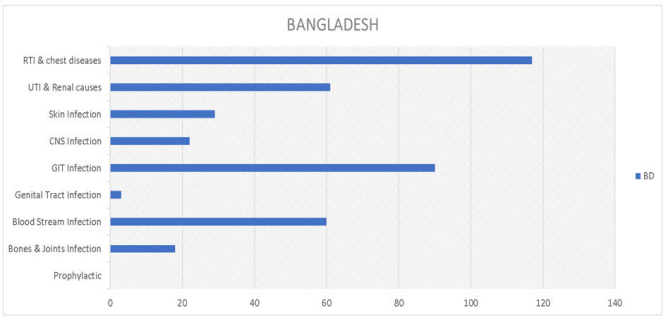

Figure 2: Distribution of infections treated in the Bangladesh across different categories.

The below graph shows the number of cases for different types of infections observed in Bangladesh. Here are the details based on the graph: Respiratory Tract Infections (RTI) and chest dsease, this category has the highest number of cases, similar to the NHS data, reaching nearly 120, which suggests that RTI and chest-related diseases are the most prevalent in Bangladesh according to the data. Gastrointestinal Tract (GIT) Infections rank second, with around 90 cases. This shows a significant prevalence of GIT-related infections. Approximately 60 cases are associated with UTI and renal issues, highlighting these infections as a common concern. Close to 60 cases of blood stream infections are documented, indicating notable occurrences. Skin infections accounted for around 30 cases, showing a moderate occurrence compared to other categories. Around 20 cases are related to CNS infections, indicating less frequent but significant instances. Bones and Joints Infections are fewer than 20 cases in this category, indicating relatively rare occurrences. Very few cases (under 10) fall under the genital tract infections, suggesting these infections are infrequent. There are no prophylactic cases shown in the graph, indicating that there were no interventions classified under this category.

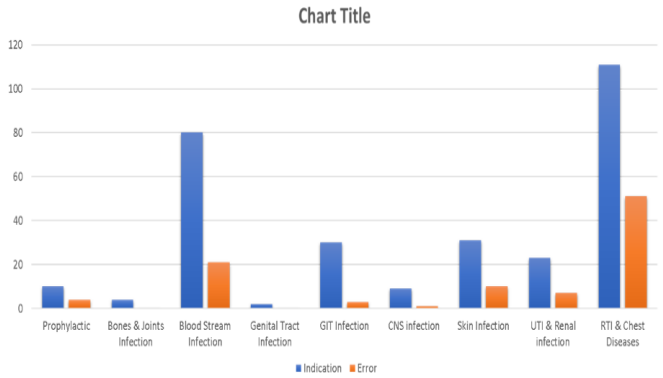

Figure 3: Number of errors according to indications (Total case 300, Total errors=97), NHS.

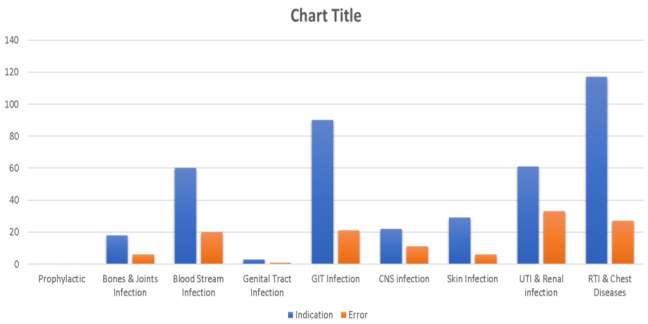

Figure 4: Number of errors according to indications (Total case 400, total errors=125), Bangladesh.

Table 1: Percentage of incorrect decisions in the NHS.

Indication	Total case	Incorrect decision	Incorrect %
Prophylactic	10	4	32.33%
Bones and joint infection	4	0	
Blood stream infection	80	21	
Genital tract infection	2	0	
GIT infection	30	3	
CNS infection	9	1	
Skin infection	31	10	
UTI other renal causes	23	7	
RTI	111	51	
Total	300	97	

Table 2: Percentage of incorrect decisions in the Bangladesh.

Indication	Total case	Incorrect decision	Incorrect %
Prophylactic	0	0	31.25%
Bones and joint infection	18	6	
Blood stream infection	60	20	
Genital tract infection	3	1	
GIT infection	90	21	
CNS infection	22	11	
Skin infection	29	6	
UTI other renal causes	61	33	
RTI	117	27	
Total	400	125	

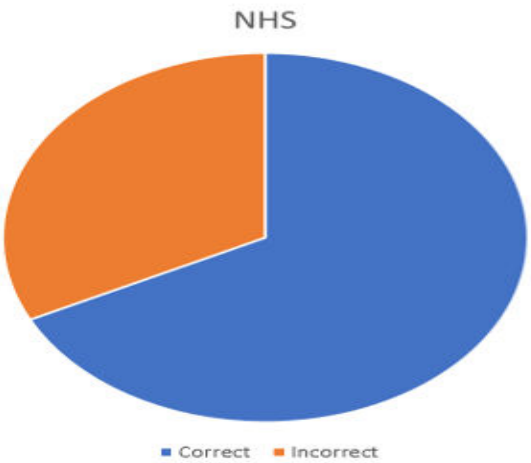

Figure 5: Compliance to trust guidelines (NHS).

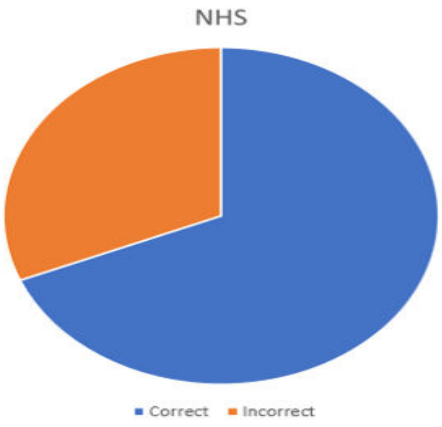

Figure 6: Compliance to guidelines (BD).

This graph depicts compliance with NHS trust guidelines. Out of 300 cases, there were 97 errors, showing a compliance rate of 67.66%, with incorrect decisions at 32.33%. Incorrect decisions by infection type for the NHS, RTI (51 out of 111 cases) had the highest incorrect percentage, while bone and joint infections had no errors.

In Bangladesh, out of 400 cases, 125 errors were noted, yielding a 68.75% compliance rate. The incorrect decision rate was 31.25%, with Urinary Tract Infections (UTI) and renal causes showing the highest errors (33 out of 61 cases). The graph also shows RTI and GIT infections had notable incorrect decision rates, while prophylactic decisions had no errors.

The comparison between NHS and Bangladesh had similar compliance rates, but Bangladesh had higher error rates for UTI and RTI cases compared to the NHS.

Considerable heterogeneity was in the patient characteristics which influenced antibiotic prescribing with pediatricians contributing to high rates of prescription, mainly for Respiratory Tract Infections (RTIs), Urinary Tract Infections (UTI) and ear-related infections. This is in line with other studies which demonstrated high rates of antibiotic prescribing for probably viral infections [7-10].

DISCUSSION

The study included data from different hospitals in Dhaka including Dhaka Medical College Hospital and various hospital of Sylhet including Sylhet MAG Osmani Medcial college; The United Lincolnshire Healthcare Trust, UK. The study included a total of 736 cases, contributed by the United Lincolnshire Healthcare Trust in the UK (336), Dhaka (200) and Sylhet (200).

In the UK, a significant volume of antibiotic throughout is used for Lower Respiratory Tract Infections (LRTIs); with subsequent utilization on bloodstream infections; UTIs; skin and soft tissue isolates alongside GI related species. Correct antibiotic prescriptions based on guidelines were most common and incorrect one's least so in these groups; only a few cases reported wrong antibiotic prescribing for blood sepsis.

In Bangladesh, the study found that 88% of LRTI were treated with antibiotics, which are also indicated for Blood Stream Infections (BSI), Urinary Tract Infection (UTIs), Skin and Soft Tissue Infection (SSTI), gastrointestinal tract enteritis. But most of these prescriptions are in line with the guidelines. Sadly, many LRTI prescriptions (and a similar proportion of BSIs) are prescribing inaccurately.

The difference in choice of antibiotics between UK and Bangladesh can all be explained by differences in healthcare infrastructure, regulatory frameworks as well as the local burden due to infectious diseases. This dialogue explores these differences, drawing attention to difficulties and approaches in the selection of antibiotics between both countries.

Regulation of antibiotic use is stringent in the UK, with bodies such as The National Institute for Health and Care Excellence (NICE)and Public Health England (PHE)having an overseeing role. These guidelines are published and written by these organizations that give recommended strategies supported evidence based guidance, reducing the use of antibiotics to counteract Antimicrobial Resistance (AMR). The UK initiative uses a Start Smart-Then Focus approach that urges clinicians to begin treatment promptly in severe infections and then re-evaluate whether antibiotics are needed within 48 hours.

The first is the robust healthcare system in place across the UK, largely delivered through state-run National Health Service (NHS) and therefore available to nearly everyone. There are laboratories with excellent diagnostic facilities to diagnose specific pathogen and their resistance patterns based on the source. It should include the establishment of an infrastructure for a narrow-spectrum antibiotic that targets individual infections to minimize selection pressure and limit development of AMR.

The challenges in Bangladesh are not simple. However, besides regulatory and infrastructural challenges, lack of awareness about AMR in healthcare providers as well public is a prime roadblock. That ignorance translates into the abuse of antibiotics. Additionally, fake and low-quality antibiotics available in the market make treatment outcomes more difficult to manage while fueling resistance.

This marks a completely opposite image of the UK where healthcare particularly regulation is stringent and an advanced country in medical care while Bangladesh, on the other hand, has its own challenges to ensure water, drug and food safety and drawbacks in implementation of laws. The evidence-based practice and the emphasis on narrow-spectrum antibiotics like in UK is often a luxury which countries such as Bangladesh cannot afford all time not only for infrastructural limitations but these cases are similar to many other tropical resource limit countries with high burden of infectious diseases. The difference in the diagnostic capacities of both countries has also a decisive influence on antibiotics selected. In the UK drug therapy can be tailored in response to precise pathogen identification, drawing from a diverse array of treatment options whereas Bangladeshis are more reliant upon empiric prescribing due to diagnostic scarcities.

The two countries have a shared AMR threat, but they address it in different ways. In the UK, awareness has been raised by strict guidelines and public health campaigns to encourage appropriate use. To the contrary, Bangladesh situates with an imperative to increase regulatory enforcement and improve diagnostic capacity alongside public pronouncement about AMR.

The World Health Organization's (WHO) expert committee developed the Aware classification (Access, Watch, Reserve) to support antibiotic stewardship, emphasizing prudent antibiotic use and monitoring patterns globally. The implementation of such guidelines is better integrated into the

UK healthcare system due to established infrastructure and regulatory oversight. In contrast, Bangladesh faces challenges in enforcing these guidelines effectively, as limited resources and inadequate healthcare infrastructure complicate the widespread adoption of such strategies.

The role of pharmacists and microbiologists in the UK is also crucial in maintaining correct antibiotic prescribing practices. Pharmacists review the prescriptions and alert clinicians to errors, while microbiologists assist with interpreting culture results and recommending appropriate antibiotics. This collaborative approach, combined with systematic checks, is largely absent in Bangladesh, where the infrastructure for interdisciplinary healthcare collaboration is underdeveloped. Despite these challenges, the study revealed that Bangladeshi doctors still demonstrate considerable adherence to guidelines, even with fewer resources and diagnostic support. This is encouraging, as it highlights the potential for improvement with enhanced support systems. For Bangladesh, focusing on regulatory reforms, increasing awareness, and upgrading diagnostic capabilities could significantly improve adherence to antibiotic guidelines and reduce the risk of AMR.

In both countries, addressing the AMR threat requires continued efforts to strengthen healthcare systems. The UK, with its advanced infrastructure and regulatory frameworks, can continue to focus on refining its antibiotic stewardship through continuous education, audits, and public health campaigns. In Bangladesh, the priority should be on building a robust regulatory framework, increasing public and provider awareness, and enhancing diagnostic infrastructure to guide proper antibiotic use.

CONCLUSION

Policymakers in the UK and Bangladesh have to take into consideration healthcare infrastructure, regulatory environments as well as of infectious diseases when defining antibiotic choice. Although the UK has a robust system with superior diagnostic services, but in Bangladesh we have an issue as our infrastructure is not enough and regulatory challenges are significant. Specific strategies are needed to meet these disparities: improving regulation and infrastructure in Bangladesh; ongoing development of stewardship practices in the UK, will ultimately help save lives worldwide as efforts need to be universal.

LIMITATIONS

The study was based on a relatively small sample size of 700 cases from selected hospitals in the UK and Bangladesh, which may not fully represent the broader healthcare systems in either country. This limited scope could affect the generalizability of the findings, particularly regarding antibiotic prescribing practices in other regions, especially rural and resource limited areas. Additionally, the study's focus on a short, six-month period may not capture seasonal variations in infection rates, further limiting the conclusions. The lack of comprehensive microbiological data also restricts the accuracy of determining whether antibiotics were appropriately prescribed.

RECOMMENDATIONS

Ultimately, the success of a guideline hinges on numerous components most notably in its development (rigour and dedication), implementation and evaluation. Guidelines need to be reviewed and, if necessary updated on a regular basis in order take into account new medical knowledge, evolving clinical practice changes in local public health priorities out outcomes of guideline appraisal analyses. The guideline is equally applicable to any adaptations. These discrepancies could be attributed to the availability of antibiotics, knowledge and training levels of medical staff as well as guidelines. Qualitative observations suggest that patients applied pressure, and there were financial incentives to bypass guidelines in Bangladesh.

ETHICAL CONSIDERATION

Ethical clearance for this study was obtained from the Institutional Review Boards (IRBs) of all participating hospitals in both Bangladesh and the UK. Informed consent was obtained from all patients or their legal guardians prior to data collection, ensuring confidentiality and adherence to ethical guidelines for human research, protecting patient rights and privacy.

REFERENCES

1. Murray CJ, Ikuta KS, Sharara F, Swetschinski L, Aguilar GR, et al. (2022) Global burden of bacterial antimicrobial resistance in 2019: A systematic analysis. Lancet. 399(10325):629-655.
2. Hoque R, Ahmed SM, Naher N, Islam MA, Rousham EK, et al. (2020) Tackling antimicrobial resistance in Bangladesh: A scoping review of policy and practice in human, animal and environment sectors. PloS One. 15(1):e0227947.
3. Ahmed S, Korpe P, Ahmed T, Chisti MJ, Faruque AS (2018) Burden and risk factors of antimicrobial use in children less than 5 years of age with diarrheal illness in rural Bangladesh. Am J Trop Med Hyg. 98(6):1571.
4. Biswas M, Roy MN, Manik MI, Hossain MS, Tapu ST, et al. (2014) Self medicated antibiotics in Bangladesh: A cross-sectional health survey conducted in the Rajshahi City. BMC Public Health. 14:1-7.
5. Nowakowska M, van Staa T, Mölter A, Ashcroft DM, Tsang JY, et al. (2019) Antibiotic choice in UK general practice: Rates and drivers of potentially inappropriate antibiotic prescribing. J Antimicrob Chemother. 74(11):3371-3378.
6. Rashid MM, Akhtar Z, Chowdhury S, Islam MA, Parveen S, et al. (2022) Pattern of antibiotic use among hospitalized patients according to WHO access, watch, reserve (AWaRe) classification: Findings from a point prevalence survey in Bangladesh. Antibiotics. 11(6):810.

7. Dolk FC, Pouwels KB, Smith DR, Robotham JV, Smieszek T. (2018) Antibiotics in primary care in England: Which antibiotics are prescribed and for which conditions?. J Antimicrob Chemother. 73(suppl_2):ii2-ii10.
8. Brauer R, Ruigómez A, Downey G, Bate A, Garcia Rodriguez LA, et al. (2016) Prevalence of antibiotic use: A comparison across various European health care data sources. Pharmacoepidemiol Drug Saf. 25:11-20.
9. Pouwels KB, Dolk FC, Smith DR, Smieszek T, Robotham JV (2018) Explaining variation in antibiotic prescribing between general practices in the UK. J Antimicrob Chemother. 73(suppl_2):ii27-ii35.
10. Gulliford MC, Dregan A, Moore MV, Ashworth M, van Staa T, et al. (2014) Continued high rates of antibiotic prescribing to adults with respiratory tract infection: Survey of 568 UK general practices. BMJ Open. 4(10):e006245.