DRUM
Drivers of Resistance in Uganda & Malawi

Ministry of Health
Government of the Republic of Malawi

LSTM
LIVERPOOL SCHOOL OF TROPICAL MEDICINE

AFIDEP
African Institute for Development Policy

ISSUE BRIEF

Antimicrobial stewardship in Malawi: Optimising antibiotic usage

November 2020

KEY MESSAGES

- Antibiotics that are effective for many infections, such as ceftriaxone, are the preferred choice in many sub-Saharan African hospitals being administered at least once a day.
- Antimicrobial stewardship (AMS) programmes are a key strategy for optimising antimicrobial usage (AMU) and controlling AMR.
- Antimicrobial stewardship (AMS) is adaptable to low-income countries like Malawi.
- AMS programmes reduce antibiotics usage (AMU) and are also cost-saving.

Context

Antimicrobial resistance (AMR) is a problem of global importance, associated with increased healthcare costs arising from increased disease and death.[1] There is a huge burden of severe bacterial infection in sub-Saharan Africa (SSA) and a lack of diagnostic tests in hospitals. Therefore, antibiotics that are effective against diverse bacteria and are administered once a day, such as ceftriaxone, have become the first choice for severe infections in hospitals. Reliance on ceftriaxone in SSA has likely been a key driver of antibiotic resistance across the continent. Antimicrobial stewardship (AMS) is any of the practices and procedures put in place to ensure best use of antibiotics. This results in improved patient care and reduced antibiotic usage hence one of the key actions of the World Health Organisation (WHO) Global Action Plan to contain antibiotic resistance.[2] Despite the AMS programmes not being common in SSA due to resource limitations, recently, the Queen Elizabeth Central Hospital (QECH) in Blantyre, established an AMS programme to ascertain its sustainability in Malawi.

Antibiotics Usage

Many SSA hospitals are resource-constrained, lacking equipment to conduct diagnostic tests needed to treat bacterial diseases specifically. With a growing population in SSA resulting in greater demand for bacterial infection treatment, patients are usually given antibiotics taken once a day that respond to varying types of infection, such as Ceftriaxone. Overreliance on these antibiotics in SSA has been a key driver of drug resistance, known as AMR, Malawi is not an exception. As observed by Holmes et al, (2016), reduction in excess antibiotics usage (AMU) has proven to slow down AMR.[3] With so many severe bacterial infections in Malawi, a deliberate collection of data from patients at QECH was done for 28 months to determine the sustainability of an adapted AMS in the country.

AMS at QECH

The WHO highly recommends AMS interventions as a way of optimising AMU and preventing AMR spread.[2] An AMS programme was established at QECH by a multidisciplinary team comprising of clinicians, nursing managers, hospital directorship, pharmacists and microbiologists. Antimicrobial susceptibility trends, antibiotic availability and national guidelines were reviewed and a new antibiotic guideline developed (http://www.microguide.eu/). The guideline focused on recognising and treating sepsis and modification of antibiotics administration after a 48-hours observation period. This guideline was co-designed, reviewed and approved by senior clinical staff, then made available in booklets, posters and as a smartphone application (e.g. https://viewer.microguide.global/QECH/ADULT4). Implementation of AMS

[1] Davey, P., Marwick, C. A., Scott, C. L., Charani, E., McNeil, K., Brown, E., Gould, I. M., Ramsay, C. R., & Michie, S. (2017). Interventions to improve antibiotic prescribing practices for hospital inpatients. The Cochrane database of systematic reviews, 2(2), CD003543. https://doi.org/10.1002/14651858.CD003543.pub4

[2] WHO (2015). Global action plan on antimicrobial resistance. https://www.who.int/antimicrobial-resistance/publications/global-action-plan/en/

[3] Holmes, A. H, Moore, L. S., Sundsfjord, A., Steinbakk, M., Regmi, s., Karkey, A., Guerin, P.J., Piddock, L.J., (2016). Understanding the mechanisms and drivers of antimicrobial resistance. The Lancet, Volume 387, Issue 10014, 176 – 187. https://doi.org/10.1016/S0140-6736(15)00473-0

was observed on the adult medical wards at QECH and had three phases: a pre-implementation prescribing survey; implementation of an antibiotic guideline (June 2016) and two post-implementation prescribing surveys (January 2017, January 2018). Point-prevalence surveys (PPS) with feedback to prescribers began at the start of the implementation phase and continued for 28-months.

AMS Interventions

The AMS intervention at QECH was adapted taking into consideration the local context. Its implementation was aided by the following facilitators;

i. Trust in the guideline content: The guideline was developed by a consensus and was deemed best suited for locals regarding antibiotic availability and disease-causing agents.

ii. Accessibility of information: Easy access to the guideline provided guidance on the prescription of antibiotics that treat specific infections, especially to junior level doctors.

iii. Awareness and promotion of stewardship and AMR: The stewardship intervention raised awareness of AMR and antibiotics over-prescription amongst physicians.

iv. However, resource limitations presented some barriers which to some extent affected the success of the AMS intervention including:

v. Operational barriers: Limited access to alternative antibiotics and comprehensive diagnostics, and inadequate nursing capacity which forces personnel to favour antibiotics that are taken only once a day.

vi. Hierarchical relationships and prescribing practice: Junior team members simply adopting prescriptions by senior colleagues with no confirmation of protocols.

vii. Rationalised overprescribing: Perception of ceftriaxone as superior leading to instances where physicians prescribe it to patients to treat infections generally without first checking the antibiotic for appropriateness for a specific infection.

viii. Despite the resource limitations at QECH, the AMS programme was successfully implemented and has demonstrated that it is feasible to adapt AMS to resource-constrained low-income countries such as Malawi.

AMS and Cost-saving

The AMS programme at QECH resulted in a 26.5% reduction in antibiotic usage as observed between 2016 and 2018. It involved all antibiotics that are taken once a day and are effective in many infections (3GC). This was without negatively impacting patient survival. The reduction in AMU further led to a mean antibiotic cost saving of US$1.56 per patient and US$15,000/year extrapolated across all the adult medical wards.

Recommendations

The QECH AMS programme demonstrated that an adapted AMS is possible, effective and acceptable in Malawi. Policymakers should therefore do the following;

Extend AMS research: The QECH AMS programme only demonstrated its sustainability in the department of adult medicine over 28 months. This should be extended to diverse settings like other medical departments and community setting.

Scale-up AMS to more hospitals: AMS was successful at QECH. It should be scaled up to other hospitals, subsequently reaping the benefits of reduced AMU and save costs of antibiotic supply. This will also reduce the transmission of AMR.

Intensify AMR awareness amongst physicians: The QECH AMS programme raised awareness of AMR amongst physicians in the department of adult medicine. Extending and scaling up AMS programmes should be encouraged as these would enhance AMR awareness in various medical departments across the country.

Conclusion

AMS adapted to a specific setting is keystone towards the reduction of excessive antibiotic use, prevention of AMR spread and consequently cost saving in resource-poor countries. However, more studies should be conducted to ascertain how such interventions can be applicable on a wider scale, to a variety of settings and for a longer period. There is also a need for increased AMR awareness among physicians. Such interventions would work in addressing the prevalence of AMR.

Acknowledgements

This issue brief has been prepared by the African Institute for Development Policy (AFIDEP) based on the study, "Sustained reduction in third-generation cephalosporin usage in adult inpatients following introduction of an antimicrobial stewardship program in a large urban hospital in Malawi" (https://pubmed.ncbi.nlm.nih.gov/32060523/). The work was led by Rebecca Lester and supported by the Drivers of Resistance in Uganda and Malawi (DRUM) Consortium. The study sought to demonstrate the feasibility, acceptability and cost-saving of a stewardship program where resources are limited. With funding from the UK Global Challenges Research Fund, the Liverpool School of Tropical Medicine (LSTM) in 2017 established the DRUM Consortium with the purpose of reducing antimicrobial resistance (AMR) spread in Uganda and Malawi. This issue brief seeks to promote and support the continued investment in antimicrobial resistance solutions.

Centre for Ecology & Hydrology
NATURAL ENVIRONMENT RESEARCH COUNCIL

wellcome sanger institute

UNIVERSITY OF LIVERPOOL