

## 0211

### A clinical study on quality use of antimicrobials and self-medication, medication adherence of antimicrobials in community and hospital settings

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**Background:** Antimicrobial resistance is a global health concern. Globally, between 20 to 50% of antimicrobial consumption is inappropriate, causing significant impact on the quality of care, cost of therapy and incidence of adverse drug reactions and posing a huge risk of antimicrobial resistance.

**Aim and objectives:** Research study aims to assess extent of quality use of antimicrobials among inpatients & outpatients by using inpatient quality indicators, outpatient quality indicators, assessing of self-medication of antimicrobials in community and general public, medication adherence to antimicrobial therapy in outpatients.

**Methods and materials:** Prospective, interventional study. Inpatient and Outpatient quality indicator were used to assess Quality use of antimicrobials. Document review of Prescriptions, Review of patient records, Overview of drug consumption in hospitals and distribution, Semi-structured interviews, Focus group discussions used for data collection.

**Results: Inpatients:** Empirical systemic antibiotic therapy prescribed according to the local guideline has improved from 58.39% to 7.95% as a result of intervention (Imposing of physicians and clinical pharmacist to strictly adhere to local guidelines which are prepared and made available). Practice of ordering at least 2 sets of blood cultures before starting systemic antibiotic therapy also improved from 33.18% to 48.96%, which profoundly impacted the appropriate antimicrobial selection. Empirical antibiotics should be changed to pathogen-directed therapy after culture results become available was also improved from 41.38% to 54.89% after intervention of using of antibiotic usage policy. **Outpatients:** Antibiotic prescribing in viral infections or (most) self-limiting bacterial infections was made to limit from 43.27% to 38.21% by intervention of prescription auditing, medication review by clinical pharmacist. Prescribed antibiotics should be chosen from an essential list/formulary also improved from 67.12% to 79.14% due to the intervention of designing and dissemination of Essential antimicrobial list and Hospital formulary for individual health care facilities.

**Conclusion:** Research study concludes that, in inpatients, outpatient's majority of antimicrobials are being used Non adherently to quality use indicators so there is a huge need of Promotion of rational use of antimicrobials by raising awareness on antimicrobial resistance and join hands of all health care professionals for combating antibiotic resistance with local solutions to tackle global challenge.

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## 0212

### War, antimicrobial resistance, and *Acinetobacter baumannii* (WAMRA)



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**Background:** Wars have been a great burden on humanity for a long period of time. The high medical costs of wars particularly those incurred in treating patients with multi-drug resistant infections is probably one of its most adverse effects. *Acinetobacter baumannii* is one of those superbugs which have gained much notoriety during times of wars for causing multi-drug resistant infections among injured military and civilian personnel. Since conflict regions are considered hot spots for heavy metals contamination, we hypothesize that exposure of *A. baumannii* to heavy metals coming from shelling and ammunition in war regions might be correlated with its increased levels of AMR. Therefore, herein we aim to investigate the effects of heavy metals on AMR of *A. baumannii* clinical isolates particularly those originating from war patients and determine the mechanisms implicated at the molecular level.

**Methods and materials:** 1 – PCR

2 – qRT-PCR

3 – Broth Microdilution

4 – Whole Genome Sequencing

5 – Gene knockout

6 – Heterologous expressions

**Results:** Antibigrams showed a wide range of resistance to almost all classes of antimicrobial agents in all tested isolates. Moreover, multi-heavy metal resistance phenotypes were observed in all isolates. Through induction of resistance and WGS, heavy metals such as Cu, Co, Zn, and Cd were shown to have co-selection potential for Cefepime resistance. Pb was shown to have co-selection potential for Gentamicin resistance while As was shown to possess co-selection potential for Colistin resistance. WGS on “Arsenic and Gentamicin” mutant revealed a potential novel resistance mechanism to Arsenate which is reduced uptake through phosphate transporters.

**Conclusion:** This is the first study to describe the clinical impact of heavy metals used in military weapons on antimicrobial resistance of *A. baumannii*. Most importantly, our study highlights

that there is a very high risk of co-selection of heavy metal and antimicrobial resistance to occur in war regions given the high concentrations of heavy metals. It also calls for further research to better understand the mechanisms of coselection by heavy metals. In addition, it prompts health organizations and policymakers to spread awareness and issue stringent legislation to reduce heavy metals contamination in the environment for effectively combating AMR.

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0213

### Antibiotic resistance and use among adult inpatients in a large urban tertiary hospital in Sierra Leone



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**Background:** The growing burden of antibiotic resistance (AR) is a global public health problem. Despite the threats to global efforts to combat infectious diseases, data to guide its prevention and control in sub-Saharan Africa is limited. This study aimed to assess AR and antibiotic use among adult inpatients in an urban tertiary hospital in Sierra Leone.

**Methods and materials:** Using a cross-sectional study design, data on antibiotic use was collected from consecutive adult inpatients ( $\geq 18$  years) between October 2017 and February 2018 at Connaught Hospital in Freetown, Sierra Leone. Antibiotic resistance rates of bacterial isolates from urine and sputum of adult inpatients ( $\geq 18$  years) were assessed from February through June 2018.

**Results:** Of the 920 patients interviewed, 753 (81.8%) were prescribed an antibiotic. Before antibiotics use, 85.1% had no leucocytes count and none had a bacterial culture. Antibiotics commonly prescribed were cephalosporins (25.0%), penicillins (23.2%) and imidazoles (20.8%). Indications for prescribing were surgical prophylaxis (15.7%), pneumonia (15.1%), and trauma (5.8%).

Of the 164 samples, 90.8% was urine. The common urinary isolates were *Escherichia coli* (29.2%), *Klebsiella pneumoniae* (19.0%), *Enterococcus faecalis* (13.1%) and *Acinetobacter baumannii* (9.4%), while that of sputum were *K. pneumoniae* (31.3%), *E. coli* (18.8%), *S. aureus* (12.5%) and *P. aeruginosa* (12.5%). Penicillin resistance rate for *E. faecium* and *S. aureus* was 100%. Gram negative resistance patterns were ampicillin (93% for both *E. coli* and *A. baumannii* and 90% *K. pneumoniae*), ampicillin-sulbactam (67% for both *E. coli* and *K. pneumoniae*), ciprofloxacin (82% *K. pneumoniae*, 70% *E. coli*, and 50% *P. aeruginosa*) and ceftriaxone (70% *E. coli*, 68% *K. pneumoniae* and 67% *E. cloacae*). The resistance rate to carbapenems for all *Enterobacteriaceae* was 13%, and 32% for all Gram-negative organisms.

**Conclusion:** We found high rates of AR, and antibiotic use, most of which were not guided by laboratory evidence. Drivers of poor prescribing practices and AR are lack of microbiological support and oversight. These are common factors in many developing countries, which lack funds and serve a sicker population. Greater investments are needed to establish antimicrobial stewardship programs and provide clinicians with diagnostic support to enable improvements in patient outcomes and rational use of antibiotics.

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Topic: Antimicrobials: Adherence and Stewardship

0214

### Practice of over-the-counter dispensary of antibiotics for childhood illnesses in Addis Ababa, Ethiopia: A simulated patient encounter study



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**Background:** Dispensary and use of antibiotics without prescriptions from qualified providers is a common practice in countries with poor pharmaceutical regulations and where due focus is not given to rational use. This practice is a main factor for the spread of antimicrobial resistance due to its non-reliance on pre-treatment microbiologic work-up, improper indications and dosing errors. This study was conducted to determine the rate of over-the-counter dispensary of antibiotics for common childhood illnesses among privately owned medicine retail outlets in Addis Ababa, Ethiopia.

**Methods and materials:** Pre-determined simulated patient visits depicting common childhood illnesses were employed to request antibiotics without prescriptions. A simple random sampling was used to select medicine retail outlets within Addis Ababa city. Trained data collectors filled structured data forms (including antibiotic requested, reasons for denial of dispense and details enquired by pharmacist) shortly after each patient enactment. Multi-variable logistic regression analysis was employed to explore factors associated with over-the-counter sales of antibiotics.

**Results:** A total of 262 simulated encounters were surveyed. Of the 262 verbal antibiotic requests, 63.4% were dispensed. Close to 60% of encounters were accompanied by questions about a doctor's visit or the child's symptomatology while a past history of drug allergies was enquired in only 11.1% of visits. Over-the-counter dispensary was more likely when dispenser queried about symptoms was made (AOR: 2.412, 95%CI: 1.236, 4.706), for requests for more than one antibiotics (AOR: 2.988, 95%CI: 1.258, 7.095) and for simulated patient demands for oral antibiotics for children with acute diarrhea (AOR: 3.297, 95%CI: 1.248, 8.712) and parenteral antibiotics for those reported to receive in-patient care for pneumonia (4.516, 95% CI: 1.720, 11.857).

**Conclusion:** The prevalence of providing antibiotics over-the-counter for pediatric illnesses in Addis Ababa is markedly high. Further studies into factors encouraging this malpractice are required. Enhancing education of personnel dispensing antibiotics and strict enforcement of national regulations are needed.

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