2030. Impact of an Antimicrobial Stewardship Program on Carbapenem Susceptibility in a National Hospital in Bhutan

Pem Chuki, MBBS, MD, DTM&H[1]; Monica L. Bianchini, PharmD, MPH[2]; Thupten Tshering, MSc[3];
Ragunath Sharma BSc[3]; Pema Yangzom BSc[4]; Ugyen Dema BSc Pharm[3];
Rachel Kenney, PharmD[2]; Gina Maki, DO [5];
Marcus Zervos, MD[5]; [1]Jigme Dorji Wangchuck National Referral Hospital, Thimphu, Bhutan; [2]Henry Ford Hospital, Detroit, Michigan; [3]Jigme Dorji Wangchuck National Referral Hospital, Thimphu, Thimphu, Bhutan; [4]Ministry Of Health, Thimphu, Thimphu, Bhutan; [5]Henry Ford Health System, Detroit, Michigan

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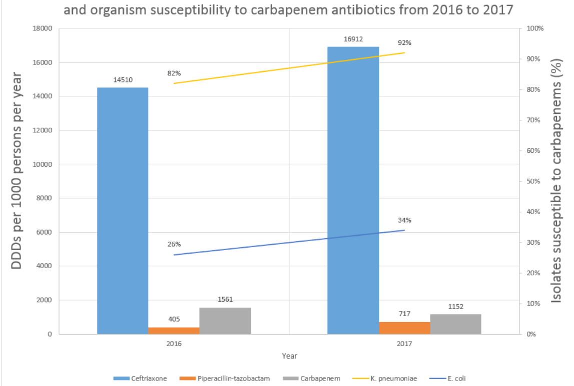
Background. The overuse of broad-spectrum antibiotics drives antimicrobial resistance (AMR), and the prevalence of highly-resistant Gram-negative infections is increasing across the world, especially in low- and middle-income countries (LMIC). Carbapenem resistance is of particular concern since these are often the last line agents. Antimicrobial restriction is an antimicrobial stewardship intervention (AMS) that aims to reduce the use of broad-spectrum antibiotics to preserve antimicrobial susceptibility.

Methods. This is retrospective, observational study of antibiotic consumption and prevalence of antibiotic resistance of bacterial isolates from inpatients at Jigme Dorji Wangchuck National Referral Hospital, a 350-bed multi-specialty hospital in Thimphu, Bhutan. Antibiotic consumption and antimicrobial susceptibility were monitored from January 2015 to December 2017 by the pharmacy department and the microbiology lab, respectively. Antibiotic consumption was measured using defined daily doses (DDD) and expressed as DDDs per 1,000 persons per day. The antibiotic susceptibility was determined using the Clinical Laboratory Standards Institute (CLSI) guideline. A hospital AMS program with multidisciplinary team and good hospital managerial/ leadership support were initiated in 2016 and interventions included antimicrobial restrictions, educations, guidelines for use, post prescription review, de-escalation, audit and feedback.

Results. From 2015 to 2016, the DDDs of carbapenems and piperacillin–tazobactam (PTZ) increased while ceftriaxone decreased (Figure 1). After the AMS program was implemented in 2016, the annual DDDs of carbapenems decreased while PTZ and ceftriaxone increased. Antimicrobial susceptibility of *Klebsiella pneumoniae* and *Escheriachia* coli blood isolates to carbapenems and ceftriaxone increased from 2016 to 2017: 50/61 (82%) vs. 45/49 (92%) and 24/91 (26%) vs. 31/92 (34%), respectively.

Conclusion. Implementing an AMS program that restricted the use of carbapenems resulted in a decrease in carbapenem use and increased antimicrobial susceptibility for carbapenems and ceftriaxone. AMS interventions can be successful to decrease carbapenem-resistance in LMIC.

Figure 1. DDDs (per 1000 persons per year) of broad-spectrum antibiotics and organism susceptibility to carbapenem antibiotics from 2016 to 2017



2031. Impact of Education and Antibiotic Guidelines on Dispensing Antibiotics with Community Pharmacists in a Low- and Middle-Income Country

Smitha Gudipati, MD; Deepak Bajracharya, BA; Lenjana Jimee, BA;
Gina Maki, DO; Marcus Zervos, MD; Tyler Prentiss, BA; Linda Kaljee, PhD; Henry Ford Health System, Berkley, Michigan

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Background. Non-prescription use of antibiotics in low- and middle-income countries has contributed to significant antimicrobial resistance (AMR). Henry Ford Health System has partnered with multinational organizations in Nepal to address the need for increasing awareness of AMR and implementation of effective antimicrobial stewardship. This partnership confirmed the importance of increasing knowledge and awareness regarding AMR and antibiotic use to community pharmacists. The present pilot study assessed if outpatient antibiotic dispensing guidelines given to community pharmacists could result in a reduction of unneeded antibiotic use.

Methods. Nine community pharmacies from Kathmandu were selected of which two were used as controls. Seven pharmacists were educated on the appropriate use of antibiotics, and outpatient dispensing before and after guidelines at all pharmacies were evaluated. The pharmacists were given guidelines on antibiotic use and duration needed for common bacterial infections encountered. Controls were not given guidelines. At baseline and post-intervention (1 week), pill counts were performed of the top six antibiotics that were dispensed by the pharmacist. Pharmacists were requested to keep a log of how many antibiotics were dispensed for one week. The pharmacists also were requested to fill out a post-intervention educational assessment to evaluate retention.

Results. Pill count pre-intervention was 15,856 and 1512 and post-intervention was 11,168 and 1,440 in the intervention and control groups respectively (Table 1). A post-intervention educational assessment revealed that both the intervention and control groups believed antibiotics can treat viruses (57% vs. 50%) and that antibiotics do not kill good bacteria that protect the body from infection (57% vs. 50%) (Table 2).

Conclusion. There was no difference in the dispensing of antibiotics between pre- and post-intervention. The findings of this study show significant room for improvement in continuing education about antibiotic use in outpatient pharmacies. Further studies are needed to target outpatient antibiotic dispensing with education and identifying economic or other incentives in hopes of reducing the burden of AMR in low- and middle-income countries.

Table 1. Antibiotic Consumption

	Intervention pharmacy 1	
Name of antibiotic	Number of pills week 1	Number of pills week 2
Cefixime	100 tablets	100 tablets
Ampicillin	60 tablets	12 tablets
Azithromycin	40 tablets	40 tablets
Ciprofloxacin	40 tablets	40 tablets
Amoxicillin	100 tablets	30 tablets
	Intervention pharmacy 2	
	Number of pills week 1	Number of pills week 2
Name of antibiotic	1100 tablets	1100 tablets
Ampicillin	1800 tablets	40 tablets
Azithromycin	1200 tablets	30 tablets
Ciprofloxacin	600 tablets	60 tablets
Amoxicillin	100 tablets	100 tablets
	Intervention pharmacy 3	
	Number of pills week 1	Number of pills week 2
Name of antibiotic	1006 tablets	1006 tablets
Ampicillin	1999 tablets	1877 tablets
Azithromycin	2447 tablets	837 tablets
Ciprofloxacin	2444 tablets	2386 tablets
Amoxicillin	120 tablets	120 tablets
	Intervention pharmacy 4	
Name of antibiotic	Number of pills week 1	Number of pills week 2
Cefixime	30 tablets	30 tablets
Azithromycin	50 tablets	30 tablets
Ciprofloxacin	100 tablets	20 tablets
Amoxicillin	100 tablets	100 tablets
	Intervention pharmacy 5	
Name of antibiotic	Number of pills week 1	Number of pills week 2
Cefixime	10 tablets	10 tablets
Ampicillin	20 tablets	20 tablets
Azithromycin	6 tablets	0 tablets
Ciprofloxacin	20 tablets	10 tablets
Amoxicillin	50 tablets	30 tablets
	Intervention pharmacy 6	
Name of antibiotic	Number of pills week 1	Number of pills week 2
Cefixime	100 tablets	30 tablets
Azithromycin	50 tablets	50 tablets
Ciprofloxacin	300 tablets	50 tablets
Amoxicillin	300 tablets	100 tablets
	Intervention pharmacy 7	
Name of antibiotic	Number of pills week 1	Number of pills week 2
Cefixime	84 tablets	75 tablets
Azithromycin	180 tablets	180 tablets
Ciprofloxacin	1100 tablets	45 tablets
	Control pharmacy 1	
Name of antibiotic	Number of pills week 1	Number of pills week 2
Cefixime	100 tablets	100 tablets
Azithromycin	200 tablets	150 tablets
Ciprofloxacin	100 tablets	100 tablets
Amoxicillin	100 tablets	100 tablets
	Control pharmacy 2	
Name of antibiotic	Number of pills week 1	Number of pills week 2
Cefixime	500 tablets	240 tablets
Ampicillin	200 tablets	280 tablets
Azithromycin	66 tablets	30 tablets
Ciprofloxacin	140 tablets	80 tablets
Amoxicillin	106 tablets	360 tablets

Table 2. Post Survey Knowledge

KNOWLEDGE ITEMS: PHARMACY STUDY	Answered Correctly-Intervention Group	Answered Correctly-Control Group
Antibiotics have saved millions of lives	100%	100%
Antibiotics are good for treating infections caused by viruses	**57%**	**50%**
Antibiotics kill bacteria that cause illness	86%	50%
Antibiotics kill good bacteria that protect the body from infection	**57%**	**50%**
Antibiotics can cure colds and flu	100%	100%
It is okay to use left-over antibiotics if you are sick or have an infections	71%	100%
It is safe to use antibiotics from family, friends, and others	86%	100%
Antibiotics can be stored and used as needed at a later date	86%	0%
Some people have allergies to antibiotics	100%	100%
When a person starts feeling better and/or symptoms have stopped, it is okay to stop using antibiotics	78%	0%
Ciprofloxacin interacts with calcium	71%	50%
Norfloxacin can be used to treat a respiratory infection	71%	100%

Disclosures. **All authors:** No reported disclosures.

2032. First National Survey of Antimicrobial and Antifungal Stewardship in Japan

Yuki Moriyama, MD[1]; Masahiro Ishikane, MD, PhD[1];
Yoshiki Kusama, MD[1]; Nobuaki Matsunaga, MD, MPH, PhD[2];
Taichi Tajima, RN[1]; Kayoko Hayakawa, MD, PhD[2]; Norio Ohmagari, MD, MSc, PhD[2]; [1]National Center for Global Health and Medicine, Shinjuku, Tokyo, Japan; [2]National Center for Global Health and Medicine Hospital, Shinjuku-ku, Tokyo, Japan

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Background. To manage antimicrobial resistance, both antimicrobial stewardship (AMS) and antifungal stewardship (AFS) are needed. However, limited data show AMS and AFS practices among hospitals in Japan.

Methods. We conducted a cross-sectional nationwide study using a questionnaire distributed to hospitals that participated in a hospital epidemiology workshop in Japan in July 2018. The questions addressed activities of preauthorization, notification, and intervention within 7 or 28 days about broad-spectrum antibiotics (third- and fourth-generation cephalosporins and piperacillin–tazobactam, carbapenem, intravenous quinolone) and antifungals. Interventions to use broad-spectrum antibiotics and antifungals were compared between large (≥501 beds) and small/medium-sized (≤500 beds) hospitals.