2030. Impact of an Antimicrobial Stewardship Program on Carbapenem Susceptibility in a National Hospital in Bhutan
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Session: 236. Antibiotic Stewardship: Global Saturday, October 5, 2019: 12:15 PM

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 Jigmé 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 year. 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, education, 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 Escherichia 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.

2031. Impact of Education and Antibiotic Guidelines on Dispensing Antibiotics with Community Pharmacists in a Low- and Middle-Income Country
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Session: 236. Antibiotic Stewardship: Global Saturday, October 5, 2019: 12:15 PM

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 unnecessary antibiotic use.

Methods. Nine community pharmacies from Kathmandu were selected for 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.

2032. First National Survey of Antimicrobial and Antifungal Stewardship in Japan
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Session: 236. Antibiotic Stewardship: Global Saturday, October 5, 2019: 12:15 PM

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, intra- venous quinolone) and antifungals. Interventions to use broad-spectrum antibiotics and antifungals were compared between large (≥501 beds) and small/medium-sized (<500 beds) hospitals.

Disclosures. All authors: No reported disclosures.
Results. Of 240 hospitals, 39 (16%) 18 large and 21 small (medium-sized) responded. Preauthorization of using broad-spectrum antibiotics and antifungals was found in 4 (10%) and 1 (2.6%) hospital(s), respectively. Notification of broad-spectrum antibiotics and antifungals was found in 37 (95%) and 2 (5%) hospitals, respectively. The numbers of hospitals that intervened in the use of broad-spectrum antibiotics within 7 days and 28 days were 17 (44%) and 34 (87%), respectively; those of antifungals were 3 (8%) and 10 (25.6%) (Table 2). Interventions to use broad-spectrum antibiotics within 7 days were statistically more frequent in small- and medium-sized hospitals than in large hospitals [13 (61.9%) vs. 4 (22.2%), odds ratio = 5.7, 95% confidence interval = 1.4–23.3, p = 0.023]. All hospitals had less-frequent interventions to use antifungals within 7 days than those for antibiotics [3 (14.3%) vs. 0 (0%) (Table 2)].

Conclusion. Small- and middle-sized hospitals had more frequent interventions within days of broad-spectrum antibiotics than those of large hospitals, possibly because small- and medium-sized hospitals are agile and have few barriers against interventions to use broad-spectrum antibiotics. Compared with broad-spectrum antibiotics, interventions of antifungals were less frequently conducted in all hospitals. We need to emphasize the importance of AFS in Japan. Further studies on related factors are needed.

Table 1. Intervention for AMS and AFS

|                      | Broad-spectrum antibiotics | Antifungals |
|----------------------|---------------------------|-------------|
| Preauthorization      | 4 (10.5%)                 | 1 (2.6%)    |
| Notification          | 37 (94.9%)                | 2 (5.1%)    |
| Interventions within 7 days | 17 (43.6%)               | 3 (7.7%)    |
| Interventions within 28 days | 34 (87.2%)             | 10 (25.6%)  |

Table 2: Comparison between small and medium-sized hospitals regarding intervention within 7 days

|                      | Small-medium hospitals (< 500 beds) | Large-sized hospitals (> 500 beds) | OR (95% CI) | p value |
|----------------------|-------------------------------------|-----------------------------------|-------------|---------|
| Preauthorization      | 13 (61.9%)                          | 6 (22.2%)                         | 5.7         | 0.023   |
| Notification          | 3 (14.3%)                           | 0 (0%)                            | -           | -       |

Disclosures. All authors: No reported disclosures.

2034. Standardized Point Prevalence Survey on Antibiotic Use to Inform Antimicrobial Stewardship Strategies in the Caribbean

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Methods. Point prevalence surveys (PPS) were performed in four acute care hospitals in Barbados, Guyana and Saint Lucia between June and July 2018. Medical records of all inpatients were reviewed to collect information on antibiotic use, indications and use of laboratory services (Figure 1). A hospital questionnaire was used to assess hospital infrastructure, policy and practices, and monitoring and feedback systems (Figure 2). Training on PPS methods and electronic data collection tool in REDCap were provided to build local capacity and identify potential ASP leaderships. A standardized data validation, analysis and reporting system was built in R to streamline the process. Results and recommendations were disseminated to national authorities and stakeholders to support hospital and national decision-making and training for healthcare providers (Figure 3).

Disclosures. All authors: No reported disclosures.

2033. A Systematic Review of Systematic Reviews: Procalcitonin in the ICU to Guide Antibiotic Therapy

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Session: 236. Antibiotic Stewardship: Global Saturday, October 5, 2019: 12:15 PM

Background. Antimicrobial resistance is an emerging global health crisis with overuse of antimicrobials as a key contributor. Strategies to safely reduce antibiotic course length are important. Procalcitonin (PCT) is a serum biomarker produced in the presence of bacterial infection. There have been many systematic reviews (SRs) evaluating PCT in various populations but its use remains controversial. The aim of this SR of SRs was to evaluate the extent to which PCT use in critical care (ICU) impacts antibiotic duration and other reported outcomes.

Methods. A systematic search of major databases using an "a priori" strategy and protocol was performed. SRs were included if one of the reported outcomes related to antibiotic duration or initiation in the ICU. Data were extracted by an author, checked and corrected independently by another author. The quality of SRs was assessed by 2 authors independently using AMSTAR II. Disagreements were resolved by consensus with a third author. Results are presented narratively and in tabular format (Table 1).

Results. Figure 1 shows the PRISMA diagram. 19 SRs were included. The number of patients included ranged from 308 to 6,037 (median = 1,316) across SRs. Overall, there was a consistent finding of a statistically significant (sf) reduction in antibiotic duration in study groups using PCT cessation protocols (all studies in Table 1). 3 SRs did not contain suitable statistics for inclusion in Table 1. SRs that presented the antibiotic duration outcome as a mean or median difference in exposure days (N = 16) showed a median reduction of 2.10 days (range = -1.19 to -5) with PCT use. 1 SR found an sf decrease in mortality with PCT use. 4 SRs included antibiotic initiation as an outcome: 2 found an sf decrease in antibiotic prescription rate with PCT, 2 found no difference.

Conclusion. SRs have found that PCT use in ICU leads to an sf reduction in antibiotic duration without impacting mortality. There are no data presented in the SRs about the impact of this on antimicrobial resistance. Few SRs detail the infections included; thus the applicability of these findings to a single ICU remains challenging. Other outcomes, such as length of stay, are not affected by PCT use in ICU.