Antimicrobial Prescribing Practices in Three Low- and Middle-Income Country Hospital Settings

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Background

- Inappropriate use of antibiotics increases selection pressure and the emergence of bacterial resistance
- In hospitalized patients, inappropriate dosing, regulation, and monitoring contribute to inappropriate use of antimicrobials
- Antimicrobial stewardship programs (ASPs) have been shown to improve the appropriate use of antimicrobials in High Income Countries (HICs)
- Hospitals in Low- and middle-income countries (LMICs) are working to implement ASPs
- It is important to determine baseline prevalence and patterns of antimicrobial use prior to the implementation of ASPs in LMIC hospitals in order to tailor the implementation and have baseline metrics for comparison.

Methods

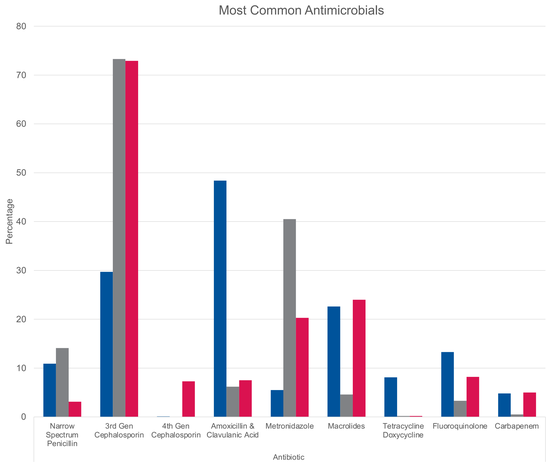
- Setting: three tertiary care centers: one each in Sri Lanka (1550 beds), Tanzania (630 beds), and Kenya (990 beds)
- Prospective cohort study of adult patients admitted to general medicine wards.
- Consecutive patients enrolled for six months at each site; research assistants reviewed medical records and extracted information regarding comorbidities, antimicrobial use, and outcomes.

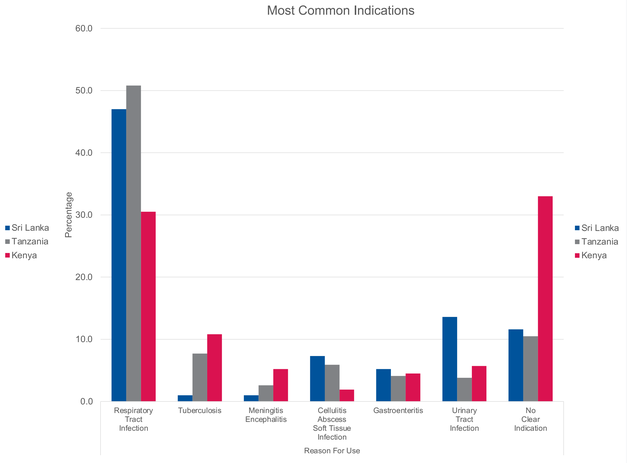
Patient Characteristics and Hospitalization Details

Characteristic			Country		
			Sri Lanka (n=1297)	Tanzania (n=1103)	Kenya (n=750)
Identifying Information					
Age	< 18		2.8	2.4	3.7
	18 - 45		24.6	32.6	43.9
	46 - 65		39.3	33.5	29.9
	> 65		32.4	31.3	22.5
Sex	Male		56.2	60.6	52.0
Chronic medical conditions	Hypertension		39.6	31.8	14.9
	Diabetes mellitus		30.9	15.5	8.3
	Chronic kidney disease		5.6	7.2	11.9
	Asthma		15.2	1.9	0.4
	Heart failure		1.2	10.2	9.2
	Ischemic heart disease		21.0	0.1	1.1
	COPD/ emphysema		5.6	1.7	4.7
	Malignancy		2.4	10.6	32.9
	HIV		0.1	9.2	15.7
	Other immunosuppressive diseases[1]		0.4	0.2	5.7
Antibiotic allergy	Not documented		55.0	45.0	5.7
	Documented	Yes	2.6	1.0	0.7
		No	42.4	53.9	93.6
Hospitalization Information					
Antibiotic therapy received			56.0	35.4	56.5
Mean hospitalization duration (days)			3 (2-4)	5 (3-8)	5 (3-9)
Microbiology/ Infectious Diseases consulted or provided input	Yes		0.9	8.6	0.5
	No		96.5	23.8	45.2
	Service not available		0	0	53.7
	Missing		2.5	67.5	0.5
Death During Admission			0.8	22.8	21.6
Antimicrobial Use Information					
Duration of antimicrobial therapy (days)[2]			4 (3-5)	6 (4-8)	5 (3-9)
Culture Result[2]	Yes		15.4	7.4	7.8
	No		79.1	61.3	91.0

1 Other immunosuppressed diseases include ALL, AML, Aplastic anemia, bicytopenia, CML, ITP, leukemia, lymphoma, multiple myeloma, NHL, Parkinson disease, PCP, Pemphigus, PML, SLE, CLL, mycosis fungoides, and RCMD.
2 Percentages based on those who received antimicrobials during hospitalization

Results





Conclusions

- Antimicrobial use was high in all three sites with 56.0% in Sri Lanka, 35.4% in Tanzania, and 56.5% in Kenya.
- As respiratory tract infections was the most common indication for antimicrobial use in all three sites, so this should be targeted first in all three sites for the development of treatment guidelines.
- Over 10% of patients receiving antimicrobials had no clearly documented indication for antimicrobial use.
- Culture results were available for a minority of patients on antimicrobials in all three sites. Increasing the use of cultures and the microbiology lab could strengthen targeted treatment and the creation of local antibiograms.

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