

Antimicrobial Susceptibility Surveillance and Development of Algorithms for Clinical Management at Kamuzu Central Hospital



Rushina Cholera, Mina Hosseinipour, Bill Miller, Mwai Makoka, Peter Gilligan, Irving Hoffman

BACKGROUND

Infectious diseases are a major part of clinical practice in the developing world. Various antimicrobial agents are used alone or in combinations to treat these infections. However, over time, many microorganisms develop resistance to these antimicrobial drugs. In the developed world, real-time determination of antimicrobial susceptibility is regularly used to guide therapeutic decisions. In contrast, resource-poor countries such as Malawi cannot provide real-time support and instead broad spectrum antimicrobial therapy is initiated empirically, based on clinical observation and patient histories. However, such broad spectrum antibiotic use is a major factor in the emergence of antibiotic resistance. As a result, clinical care is often algorithm driven, that is, clinical care choices are made by following specifically formulated decision pathways that lead from the presenting complaints of a patient, through examination findings, to therapeutic choices. In order to ensure that clinical algorithms are accurate and effective, they must be periodically evaluated.

RESEARCH SETTING

Kamuzu Central Hospital (KCH) in Lilongwe, Malawi is a tertiary center serving the central region of Malawi. It has ~1000 beds and provides services to the patient catchment areas of Lilongwe district (1.4 million citizens) and the Central region (4.2 million citizens). Over the past 15 years, UNC, in collaboration with the Malawian government has established a research, care, and training program at KCH. The UNC Microbiology Survey at the UNC Project in Lilongwe, Malawi has been ongoing since July 2006 and is now in its final stages, with an anticipated end-date of December 2007.

OBJECTIVES

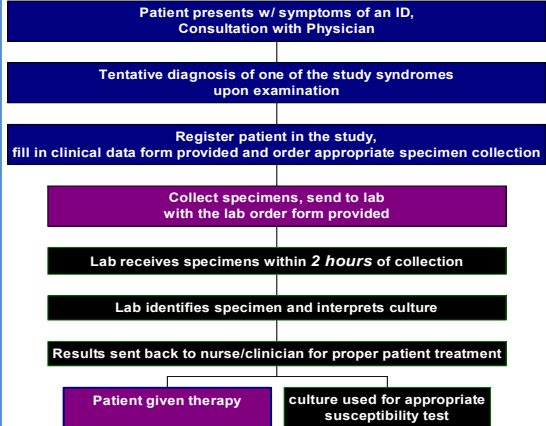
1. To identify and determine the antibiotic susceptibility of virulent bacteriologic pathogens presenting in four different wards (Medicine, OB/GYN, Pediatrics, and Surgery) at Kamuzu Central Hospital (KCH)
2. To use this data along with clinical data to design updated algorithms for patient care.

SUMMER 2007

Objectives for May-August 2007 included clinical, laboratory, and data analysis components:

1. To work with and train clinicians to enroll eligible patients and to collect sterile specimens
2. To increase specimen collection from ~100 specimens/month
3. Perform microbiology workup and update microbiology procedures
4. Create an updated database in Microsoft Access and perform a preliminary descriptive data analysis

STUDY DESIGN



ANTIBIOTICS TESTED

Gram Pos	Gram Neg
Ceftriaxone	Chloramphenicol
Chloramphenicol	Nalidixic Acid
Clindamycin	TMP/SXT
Erythromycin	Gentamicin
TMP/SXT	Ampicillin
Gentamicin	Cipro
Oxacillin	Ceftriaxone
Tetracycline	

Demographic Data

407 Males, 557 Females
Age range: 0-87 years
Mean age= 23. 8 years

RESULTS

Total # specimens=2028	
998 Blood	67 Pus
716 Malaria	27 Wound Swab
80 CSF	23 Joint Fluid
75 HVS	22 Sputum

Pathogens Isolated

S. Aureus	83	Salmonella	11
S. Pneumo	45	P. Aeruginosa	16
Strep spp.	26	Klebsiella	9
GNR	13	S. Pyogenes	15
E.coli	22	Proteus spp.	6

Department	Patients Enrolled
Medicine	545
OB/GYN	118
Paeds	288
Surgery	97

Increase in Specimen Collection

Month	Number of Samples
March	122
April	204
May	367
June	357

*>50% increase in specimens

Antibiotic Susceptibility- S. Aureus

Drug	# Specimens	% Sensitive	% Resistant
Chloramphenicol	72	44.44	47.22
Clindamycin	112	61.61	11.61
Erythromycin	113	38.94	42.48
Gentamicin	112	66.07	30.36
Oxacillin	110	41.82	46.36
Tetracycline	121	20.66	68.595
TMP/SXT	108	24.07	73.15

