Antimicrobial Susceptibility Profile at Uganda Martyrs Hospital Lubaga, Kampala Uganda

Nakiboneka Winnie & Laboratory Technologist

INTRODUCTION

The majority of infectious diseases are of bacterial in origin. With the discovery of laboratory methods to grow these microorganisms using an appropriate growth medium known as "culture," determining the sensitivity and resistance of specific pathogens to a wide range of antimicrobial agents is necessary so clinicians can immediately institute proper treatment regimens. (Bayot & Bragg, 2024) This targeted approach of treatment is considered the gold standard however most clinicians use or opt for empiric antibiotic therapy as an approach to treat the suspected infection. This has resulted into irrational use of antibiotics in clinical practice hence and emerging antimicrobial resistance.

Antimicrobial resistance (AMR) has emerged as a major threat to public health globally. (Gajic et al 2022) An estimated 1.14 million deaths were directly caused by antimicrobial resistance (AMR) in 2021 worldwide, and it is projected that over 39 million people will die from AMR-related infections between 2025 and 2050 (GBD 2021)

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This public health crisis has potential severe implications for resource-limited settings. However, accurate and rapid detection of resistance to antimicrobial drugs, and subsequent appropriate antimicrobial treatment, combined with antimicrobial stewardship, are essential for controlling the emergence and spread of antimicrobial resistance. (Gajic et al 2022)

Therefore, the purpose of this study is to: develop an antibiogram to empower doctors to make informed prescribing decisions in the clinic regarding use of antibiotics at Uganda martyrs’ hospital Lubaga and to generate data regarding the concept to bring greater clarity to this issue.

II. METHODOLOGY

This study was a retrospective analysis conducted in the microbiology laboratory at Uganda Martyr’s Hospital. The susceptibility data obtained from the Vitek 2 Compact, based on client samples for culture and sensitivity, were evaluated for the year 2024.

Uganda Martyrs' Hospital Lubaga Laboratory Microbiology Laboratory 2024																
Organism	Number of Isolates	Antibiotics														
		ceftriaxone	Cefotaxime	Amoxicillinclavulanic	Ampicillin/sulbactam	Gentamycin	Ciprofloxacin	Trimethoprimsulfamethoxazole	Nitrofurantoin	Cefoxitin	Amikacin	meropenem	Cefepime	Cefuroxime	Aztreonam	Ceftazidime
Klebsiella Pneumoniae	57	05	11	44	09	55	43	13	30	98	93	99	06	05	33	05
		95	89	56	91	45	57	87	70	02	07	01	94	95	67	95
Escherichia Coli	122	19	16	66	31	75	40	08	95	94	100	100	21	19	26	17
		81	84	34	69	25	60	92	05	06	00	00	79	81	74	83
Pseudomonas Aeruginosa	12	Cefepime	Piperacillin Tazobactam			Ceftazidime	Ciprofloxacin				Amikacin	Meropenem			Aztreonam	
		80	83			50	75				80	90			41	
		20	17			50	25				20	10			59	
ORGANISM	NUMBER OF ISOLATES	Erythromycin	Clindamycin		Tetracycline		Vancomycin	Trimethoprimsulfamethoxazole	Nitrofurantoin	Linezolid			Ciprofloxacin	Levofloxacin	Moxifloxacin	Gentamycin
Staphylococcus Heamolyticus	67	08	26		08		92	15	97	90			19	26	92	29
		92	74		92		08	85	03	10			81	74	08	71
Staphylococcus Aureus	24	13	38		67		100	38	100				100	67	59	35
		87	62		33		00	62	00				00	33	41	65

Key

(red)	Percentage of the isolate resistant to the antibiotic
(green)	Percentage of the isolate susceptible to the antibiotic
	The organism was not exposed to the antibiotic or not recommended
(peach)	Gram negative
(pink)	Gram positive

Notes

Data from organisms with fewer than 30 isolates (n=30) may lead to interpretation errors. (CLSI 2024). However, Pseudomonas Aeruginosa and Staphylococcus Aureus were included for because of their medical implication and future reference this being a baseline Antimicrobial Susceptibility Profile.

Nitrofurantoin reported on urine isolates only. (CLSI 2024).

Antibiogram results are interpreted as percentages to determine the susceptibility of organisms to different antimicrobials. The percentage susceptible (%S) is used to guide treatment decisions.

Susceptibility Categories (The Sanford Guide, 2024)

1. *Susceptible:* If a high % of bacterial isolates (90% or more) are categorized as susceptible to an antibiotic, it is considered an effective choice for treatment.
2. *Intermediate:* susceptibility range (50 – 89%), it may still be effective in certain situations depending on factors like the site if infection and the patient's clinical condition.
3. *Resistant:* susceptibility range (<50%), is classified as resistant and alternative treatment options should be considered.

If the risk of morbidity and/or mortality is high, agents with 90-95% susceptibility should be selected. Agents with 80-85% susceptibility may be acceptable for treating infections in patients without a risk for morbidity and/or mortality in the next 24-48 hours. However, other factors need to be considered in conjunction with the antibiogram. (The Sanford Guide, 2024)

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