Infection Pattern, Etiological Agents And Their Antimicrobial Resistance At A Tertiary Care Hospital In Moshi, Tanzania

> Happiness Kumburu PhD candidate KCMUCo 23rd October,2014

Introduction

 Resource limited settings are endemic to most bacterial infections, yet enough efforts are not employed to combat the burden of disease



Clinical care physicians are faced with a variety of infections in need of immediate treatment or infection control measures.

Objective

 To determine infection pattern, etiological agents and their antimicrobial resistance among patients with different health conditions admitted at KCMC tertiary care hospital.

Sample collection and processing

Sample collection



Sample processing at KCMC/KCRI biotech laboratory





Findings... pattern of infection



Figure1A: Showing number of isolates obtained from wounds of different causes. Figure1B: Showing number of isolates obtained from patients who were diagnosed to have diabetes, pneumoniae, septicemia, and fever of unknown origin.

Findings

Etiological agents

320 sample -218bacterial isolates 19 (8.7%) stool 10 (4.6%) blood 166 (76.1%) wound/pus swabs 22 (10.1%) sputum 1 (0.5%) CSF

- Proteus spp, Pseudomonas spp, E.coli, Enterobacter spp, Klebsiella spp were the most common isolated gram-negative bacteria with 18.8%, 14.47%, 14%, 10.1, and 8.7% respectively.
- The most common gram-positive isolate was Staphylococcus aureus with 8.7%.

Etiological agents Nosocomial& community acquired infections

- 152(69.7%) of 218 isolates were defined to be nosocomial or community
- *𝔅* 34 (22.4%) community acquired infection

Antimicrobial susceptibility Testing

Antimicrobial drug	Number of			Nu	mber of intermedi	iate isolates 1	Number Resistance		Total Number	
	Susceptible					I	Isolates		of isolates	tested per drug
	Isolates		(%)	n		(%)	n	(%)	n	(%)
Ampicillin		21		: 72	4	3.6	85	77.3	110	100
Ceftazidime		46	42	.6	1	0.9	61	56.5	108	100
Cefazoline		4	11	.8	2	5.9	28	82.4	34	100
Chloramphenica l		84	63	.6	1	0.8	47	35.6	132	100
Gentamycin		58	52	.3	1	0.9	52	46.8	111	100
Trimethsulpha		42	33	.6	2	1.6	81	64.8	125	100
Cefoxitin		6	3	30	0	0	14	70	20	100
AmoxClav		43	38	.7	12	10.8	56	50.5	111	100
Vancomycin		20	83	.3	0	0	4	16.7	24	100
Ciprofloxacin		43	38	.7	2	1.8	66	59.5	111	100
Nalidixic acid		42	39	.3	0	0	65	60.7	107	100
Penicillin		3	13	.6	0	0	19	86.4	22	100
Ceftriaxone		15	29	.4	4	7.8	32	62.7	51	100
Erythromycin										
		15	68	.2	0	0	7	31.8	22	100

Etiological agents and site of infection

 Antimicrobial susceptibility testing was done on 14 drugs.

 Drugs that had high percentage of resistance Ampicillin (77.3%),
Trimeth-sulpha (64.8%),
Nalidixic acid (60.7%) and
Ciprofloxacin (59.5%).

Discussion

Infection pattern and Etiological agents

High prevalence of Gram negatives bacteria in this study

Agreement with a study in Mwanza by Mshana et al,2009., In Stockholm by Källman et al ,2006 and Ran et al in 2008 Wenchuan earthquake,2010. In contrast with Mwalla et al ,2011 in Bugando. Surgical site infections

The frequency of isolation was as *Pseudomonas spp*, *Proteus spp*, *Staphylococcus aureus* and *E.coli* Agree with Pondei et al ,2012.

Discussion

High prevalence(76.6%) of nosocomial infection –in this study

In contrast with

Bagheri et al,201 where by in Ethiopia 10.9%,

other African countries 2.5%-14.8% and

in Europian countries $\frac{1}{2}$ of than in African countries.

Antimicrobial susceptibility pattern

Proteus spp, Pseudomonas spp, E.coli, Enterobacter spp, Klebsiella spp were the most common isolated gram-negative bacteria with 18.8%, 14.47%, 14%, 10.1, and 8.7% respectively. Majority of them showed high resistance to Ampicillin (77.3%), Trimeth-sulpha (64.8%), Nalidixic acid (60.7%) and ciprofloxacin (59.5%)

In agreement with studies in Dar and Mwanza by Ndugulile et al,2005 and Mshana et al 2009.

Conclusion

 Bacteria infections are still a major problem in most developing countries. Proper identification and determination of antimicrobial resistance of the bacterial pathogens is crucial in order to help physicians to provide proper treatment promptly.

Recommendation

Disease pattern in Africa is different from that found in Western Europe and America. African countries should emphasize on diseases surveillance in order obtain data that correlate with diseases situation in the region and hence come up with proper disease intervention for Africans.



References

Tamma PD, Cosgrove SE, Maragakis LL. Combination therapy for treatment of infections with gram-negative bacteria. Clin Microbiol Rev [Internet]. 2012 Jul [cited 2014 Sep 15];25(3):450–70

Ndugulile F, Jureen R, Harthug S, Urassa W, Langeland N. Extended Spectrum β -Lactamases among Gram-negative bacteria of nosocomial origin from an Intensive Care Unit of a tertiary health facility in Tanzania. 2005;6:1–6.

Källman O, Lundberg C, Wretlind B, Ortqvist A. Gram-negative bacteria from patients seeking medical advice in Stockholm after the tsunami catastrophe. Scand J Infect Dis [Internet]. 2006 Jan [cited 2014 Oct 14];38(6-7):448–50.

Ran Y-C, Ao X-X, Liu L, Fu Y-L, Tuo H, Xu F. Microbiological study of pathogenic bacteria isolated from paediatric wound infections following the 2008 Wenchuan earthquake. Scand J Infect Dis [Internet]. 2010 May [cited 2014 Oct 14];42(5):347–50.

Mawalla B, Mshana SE, Chalya PL, Imirzalioglu C, Mahalu W. Predictors of surgical site infections among patients undergoing major surgery at Bugando Medical Centre in Northwestern Tanzania. BMC Surg [Internet]. 2011 Jan;11:21.

Pondei K, Fente BG, Oladapo O. Current microbial isolates from wound swabs, their culture and sensitivity pattern at the niger delta university teaching hospital, okolobiri, Nigeria. Trop Med Health [Internet]. [cited 2014 Oct 14];41(2):49–53.