Bacterial and Antimicrobial Susceptibility Profile and Prevalence of Sepsis Among Burn Patients at the Burn Unit of Cipto Mangunkusumo Hospital

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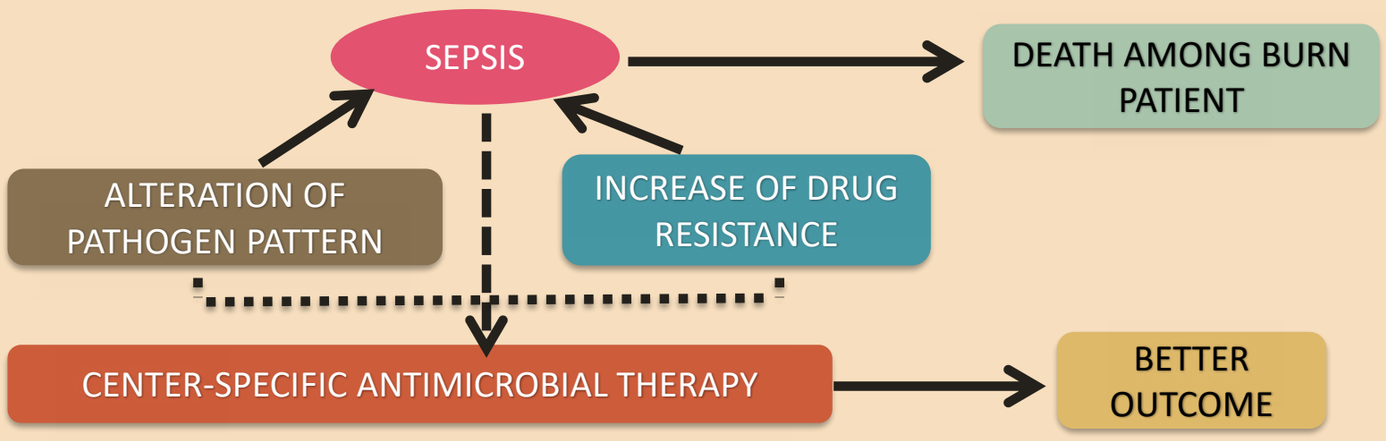
Introduction



Method

- A Retrospective Study
- Conducted at Cipto Mangunkusumo Hospital Burn Unit
- September – November 2016

Results

Figure 1. Bacterial Isolates Pattern in the RSCM Burn Unit September – November 2016

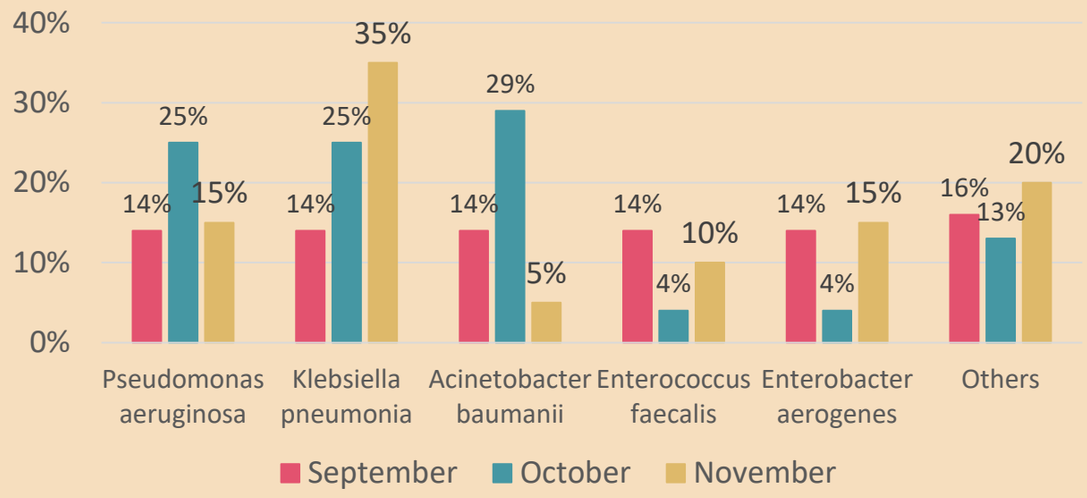


Table 1. Patterns of Antibiotic Resistance among Common Organisms at the RSCM burn unit

Resistance Antibiotics (n=9)	Organisms		
	Klebsiella pneumoniae (n=15)	Pseudomonas aeruginosa (n=11)	Acinetobacter baumannii (n=10)
Cephalosporin			
Ceftriaxone	10 (67%)	10 (91%)	9 (90%)
Cefoperazone / Sulbactam	5 (33%)	8 (73%)	2 (20%)
Carbapenem			
Doripenem	8 (53%)	7 (64%)	7 (70%)
Meropenem	3 (20%)	8 (73%)	7 (70%)
Imipenem	2 (13%)	8 (73%)	7 (70%)
Aminoglycosides			
Gentamicin	11 (73%)	8 (73%)	8 (80%)
Amikacin	4 (27%)	8 (73%)	7 (70%)
Tetracycline			
Tetracycline	9 (60%)	9 (82%)	9 (90%)
Glycylcycline			
Tigecycline	2 (13%)	10 (91%)	5 (50%)

Table 2. Patterns of Antibiotic Sensitivity among Common Organisms at the RSCM burn unit

Sensitive Antibiotics (n=9)	Organisms		
	Klebsiella pneumoniae (n=15)	Pseudomonas aeruginosa (n=11)	Acinetobacter baumannii (n=10)
Carbapenem			
Imipenem	12 (80%)	3 (27%)	2 (20%)
Meropenem	11 (73%)	3 (27%)	2 (20%)
Doripenem	10 (67%)	3 (27%)	2 (20%)
Aminoglycosides			
Amikacin	9 (60%)	3 (27%)	2 (20%)
Gentamicin	2 (13%)	3 (27%)	1 (10%)
Glycylcycline			
Tigecycline	1 (7%)	0	1 (10%)
Cephalosporin			
Cefoperazone/ Sulbactam	3 (20%)	2 (18%)	3 (30%)
Ceftriaxone	0	1 (9%)	0
Tetracycline			
Tetracyclin	0	0	0
Colistin			
Polymixin B	0	4 (36%)	0

Table 3. Bacteria Etiology of Sepsis in Burn patients (September – November 2016)

Organism Etiology of Sepsis	No. of Isolates* (n=45)	Wound Swab	Tissue	Sputum	Blood
Pseudomonas aeruginosa	15 (33,3%)	7	6	2	0
Klebsiella pneumoniae	13 (28,9%)	2	4	5	2
Acinetobacter baumannii	5 (11,1%)	2	1	2	0
Enterobacter aerogenes	3 (6,7%)	1	1	1	0
Enterobacter cloacae	3 (6,7%)	0	0	3	0
Staphylococcus saprophyticus	2 (4,4%)	1	0	0	1
Proteus mirabilis	2 (4,4%)	1	0	1	0
Enterococcus faecalis	1 (2,2%)	0	1	0	0
Staphylococcus aureus	1 (2,2%)	0	1	0	0
Total	45	14	14	14	3

Figure 2. Sepsis Prevalence in RSCM Burn Unit September - November 2016

Conclusion

- Etiologic agents of burn infection in our setting alternated continuously every month.
- Almost all bacterial isolates are classified as multi-drug resistant, with high resistance rates to our empirical therapy (ceftriaxone) leading to outbreak of sepsis and mortality rates.
- Combination of Carbapenem (Imipenem, Meropenem and Doripenem) and Aminoglycosides (Amikacin) are selected as empirical therapy.

Future Prospective

- Combination of Carbapenem group and Aminoglycosides group antibiotics can be used as the therapy for sepsis caused by burn infection.
- This study might need to be continued in the other setting, especially in the other hospital and countries to make the universal guidelines therapy of burn infection cases.

References

1. Issler-Fisher AC, Fakin RM, Fisher OM, McKew G et al.: Microbiological findings in burn patients treated in a general versus a designated intensive care unit: Effect on length of stay. Burns, 42(8): 1805-18, 2016.
2. Leseva M, Arguirova M, Nashev D, Zamfirova E, Hadzhyiski O: Nosocomial infections in burn patients: etiology, antimicrobial resistance, means to control. Ann Burns Fire Disasters, 26(1): 5-11, 2013
3. Lister PD, Wolter DJ, Hanson ND: Antibacterial-resistant Pseudomonas aeruginosa: clinical impact and complex regulation of chromosomally encoded resistance mechanisms. Clin Microbiol Rev, 22(4): 582-610, 2009
4. Huang G, Yin S, Xiang L, Gong Y et al.: Epidemiological characterization of Acinetobacter baumannii bloodstream isolates from a Chinese Burn Institute: A three-year study. Burns, 42(7): 1542-7, 2016.