NOSOCOMIAL INFECTIONS IN IMMUNOCOMPROMISED PATIENTS IN A TERTIARY CARE INTENSIVE CARE UNIT

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INTRODUCTION :

A nosocomial infection is defined as an infection that is not present or incubating when the patient is admitted to hospital or other health care facility. It has been reported that the incidence of nosocomial infections in the intensive care unit (ICU) is about 2 to 5 times higher than in the general in-patient hospital population. Critically ill patients are at higher risk for infections because of their debilitated condition and frequent need for invasive procedures. Majority of these infections qualify as hospital acquired infections (HAI's). Antimicrobial resistance increases in such cases making increase in morbidity and mortality. HAI's and sepsis are a leading cause of death in ICU's. It has been suggested that the immune suppression accompanying sepsis contributes to late sepsis mortality in the intensive care unit (ICU) caused by an increased occurrence of secondary infections.

This retrospective study was undertaken to identify the common sites of infections in patients admitted in the critical care units and study the microbiology and antimicrobial susceptibility pattern.

METHODS :

A total of 8762 clinical samples from 2879 patients, admitted to the ICU, were received by the Department of Microbiology from January 2015 to September 2017 and were included in this retrospective study. All the samples were processed on MacConkey's agar and 5% sheep blood agar as per standard microbiological methods. Identification of the microorganisms and antimicrobial susceptibility testing was performed as per CLSI guidelines.

RESULTS :

- 8762 clinical samples received from 2879 patients.
- 49.1 % were samples received from surgical oncology patients as compared to 31.5% from medical oncology patients.
- Pathogenic microorganisms were isolated from 36.5% of samples.
- Lower respiratory tract infection (33%) was the commonest hospital acquired infection, followed by blood stream infections (17.7%) , surgical site infections (6.9%) and urinary tract infection (6.6%).
- SSI was microbiologically documented in 76.3%, LRTI in 48.4%, UTI in 25.3% and BSI in 17.7% samples.
- The commonest isolate from blood was *Klebsiella pneumoniae* (31.3%) followed by *E.coli* (15.4%).
- Colistin (93.1%) was the most susceptible antimicrobial in BSI followed by amikacin (38.2%).
- In LRTI samples, *Klebsiella pneumoniae* (29.3%) was the commonest isolate followed by *Pseudomanas aeruginosa* (28%).
- Colistin (99.7%) was the most susceptible antimicrobial in LRTI samples followed by amikacin (48.3%).
- The commonest isolate from UTI was *E.coli* (21.8%) followed by *Klebsiella pneumoniae* and *Candida spp*(21.8%).
- Colistin (93.8%) was the most susceptible antimicrobial in LRTI samples followed by amikacin (55.4%).
- Multi-drug resistance was seen in 85.7% organisms.

Table-1 : Distribution of samples (n=8762) and +ve growth

SAMPLES	NUMBERS	+VE GROWTH(%age)
Blood	3074(35.1%)	743 (24.2)
NDBAL	1552(17.7%)	609 (39.2)
Sputum	809(9.2%)	364 (45)
BAL	534(6.1%)	428 (80.1)
Wound Swab	438(5%)	346(78.9)
Urine	438(5%)	85 (19.4)
Bile	332(3.8%)	145 (43.7)
Drain Fluid	293(3.3%)	215 (76.8)
Stool	267(3.1%)	65 (24.3)
CSF	250(2.9%)	39 (15.6)
Catheter Tip	204(2.3%)	62 (30.4)
Pleural Fluid	203(2.3%)	48 (23.6)
Abdominal Fluid	178(2.0%)	132 (74.2)
Pus	169(1.9%)	117 (69.2)

Table-2 : Distribution of Pathogens

GROWTH	NUMBERS
Klebsiella pneumoniae	1221
E. coli	712
P. aeruginosa	546
Acinetobacterspp.	421
Candida spp	247
Enterococci spp	237
S. aureus	167
Shewanella spp	93
Pseudomonas spp.	82
S. maltophilia	51

Table - 3 : Service wise distribution

SERVICE	TOTAL SAMPLES	+VE GROWTH (%AGE)
Medical Oncology	2511	791(31.5)
Surgical Oncology	7148	3509 (49.1)
Preventive Oncology	31	10 (32.3)

Table-4:Antimicrobial Susceptibility pattern of the Gram Negative isolates

ANTIBIOTIC	OVERALL %AGE	ACINETOBACTER SPP	E.COLI	KLEBSIELLA SPP	PSEUDOMONAS AERUGINOSA
AMIKACIN	48.5	11.7	77.3	32.3	61.8
CEFTAZIDIME	29.9	5.9	18.1	47.8	62.6
CFS	35.2	8.5	39.1	22.3	54.9
CIPRO	32.1	12.5	19.9	21.7	63.1
COLISTIN	98.2	100	99.4	96.5	100
CEFOTAXIME	17.3	2.3	15.6	14.4	--
CEFEPIME	1.4	0.3	2.3	1.4	0.8
GENTA	44.2	12.5	57.1	28.9	60.1
IMIPENEM	14.3	3.3	41.7	8.6	6.3
MEROPENEM	12.2	2.3	40.6	6.7	5.5
TOBRA	48.2	19.1	43.8	31.9	61.7
PIP-TAZ	34.4	7.2	34.4	20.4	60.2
TIGECYCLINE	91.3	--	98.2	88.9	--

Table-5:Antimicrobial Susceptibility pattern of the Gram Positive isolates

ANTIBIOTIC	OVERALL %AGE	S.AUREUS	STREPTOCOCCUS SPP.	ENTEROCOCCI SPP.
VANCOMYCIN	93.7	100	93.3	88.1
TEICOPLANIN	92.4	100	90	87.3
LINEZOLID	99.6	100	100	99.1
CLINDAMYCIN	65.3	74.7	75	91.7
GENTAMICIN		81.5	80	18.8

CONCLUSION :

The prevention of ICU acquired infections requires knowledge of the infection rates and of the sources, the pathogens involved as well as the antimicrobial susceptibility pattern. Intensive care unit acquired infections have been reported to be associated with increased length of ICU and hospital stays. It is necessary to have a strong antimicrobial stewardship programme and good infection control practices to control the spread of multidrug resistant organisms in critical care units. The possible source of S. maltophilia isolates from respiratory tract is water. This needs to be addressed to control the spread.

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