CLINICAL PROFILE OF SEPSIS AND CARBAPENEM RESISTANCE AMONG ICU PATIENTS

Paper Presentation

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INTRODUCTION

- Sepsis is a common cause of admissions to intensive care units and severe sepsis and septic shock contribute to significant morbidity and mortality in ICU patients.
- The mortality rate of sepsis ranges from 30-40% in spite of the availability of high-efficacy antibiotics.
- The emergence of multidrug-resistant bacteria and the lack of new antibiotics to combat them have led to the use of higher antibiotics like meropenem.

OBJECTIVES

- **Primary outcome variable :** The clinical profile of the patients with sepsis as a part of following:
  - Pre admission morbidities
  - Vital parameters and laboratory data
  - APACHE II score, SAPS II score, qSOFA score and SOFA score
  - Outcome variable as length of stay and 28 day survival/death/discharge.
- **Secondary outcome variable :** Proportion of carbapenem resistant bacteria isolated in sepsis patients admitted in Medical ICU.

METHODS

- We conducted a prospective observational study, In patients admitted In Medical ICU in LHMC

- **Inclusion Criteria** :
  - ✓Age > 18 years and patients getting admission in medical ICU.
  - ✓Patient having suspected/documented sepsis
  - ✓Patient having qSOFA or SIRS score more than or equal to 2.
- **Exclusion Criteria**
  - Patient readmitting in ICU in same hospital stay

METHODS

- We recruited 100 consecutive patients who had clinical evidence of infection and qSOFA or SOFA score ≥ 2 and who gave consent for the study along with fulfilling the inclusion criteria and exclusion criteria.
- Each patient was subjected to appropriated clinical history, general physical and systemic examination and blood investigation including culture specimens.
- With the help of this data, we calculated SOFA, SAPS and APACHE-II score. Patient was observed upto day 28 of admission or day of discharge or day of death.

OBSERVATIONS

- Mean age of the study population was 52 ± 17.82 years.
- There was slight Male (54%) preponderance compared to female MICU patients (46%).
- Mean duration of ICU stay in our study population was 8.28 ± 8.11 days.
- In our ICU study population, the overall Mortality rate was 64%.

RESULTS

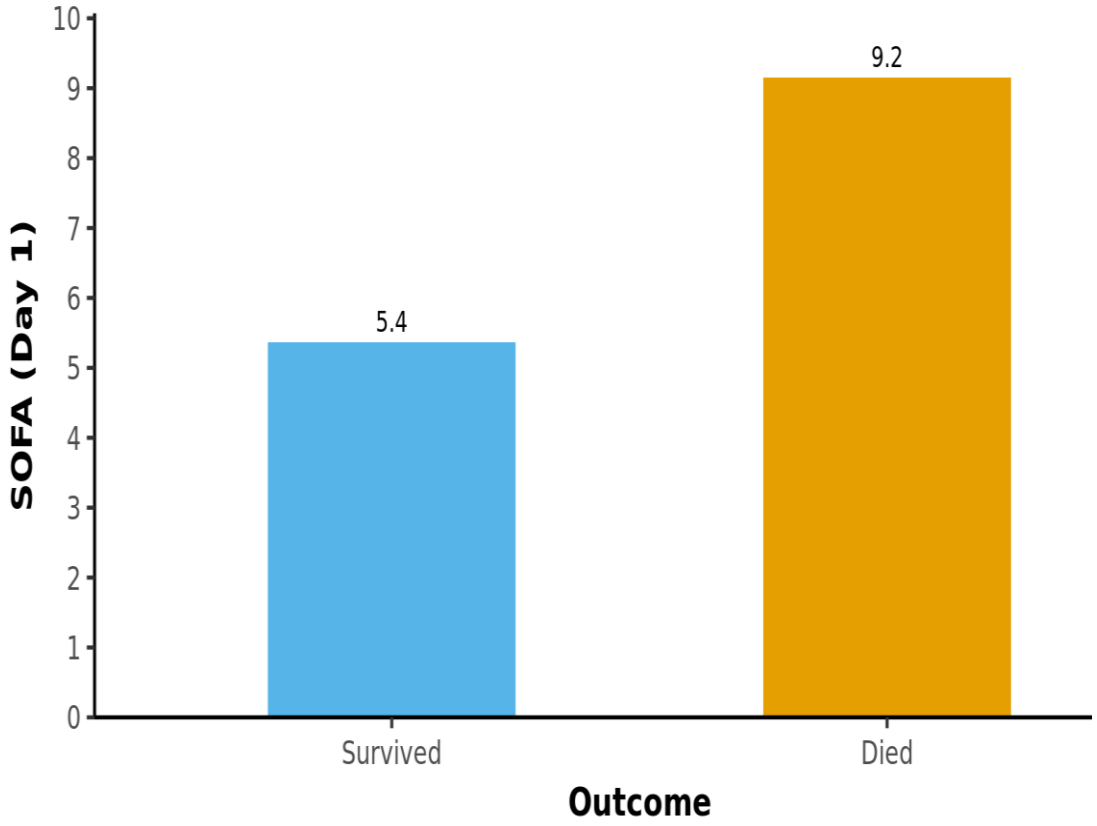
- Mean qSOFA score of ICU admitted sepsis patients was 1.66 ± 0.71.
- The higher qSOFA score at admission was significantly associated with high mortality (p-value = 0.017). For qSOFA score ≥2 the mortality was as high as 71%-75%.
- There was significant positive correlation between qSOFA score and SOFA score (p-value < 0.001).

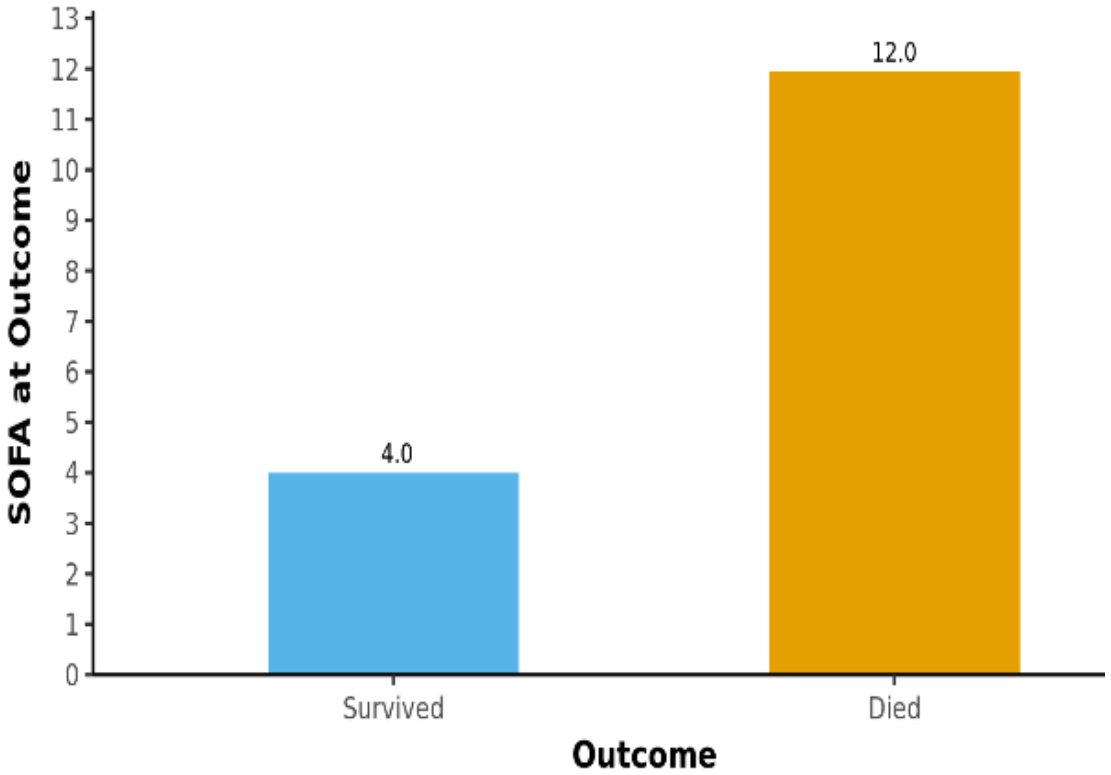
RESULTS

- Mean APACHE-II score in our study population was 18.23 ± 8.49. APACHE-II score was significantly higher in non-survivors compared to survivors (21.38 v/s 12.64). (p value < 0.001)
- Mean SAPS score in our study population was 47.21 ± 16.60. SAPS score was significantly higher in non-survivors when compared to survivors (52.94 v/s 37.03). (p-value < 0.001)
- Mean SOFA score in our study population was 7.79 ± 4.43. SOFA score was significantly higher in non-survivors when compared to survivors (9.16 v/s 5.36). (p-value < 0.001)

RESULTS

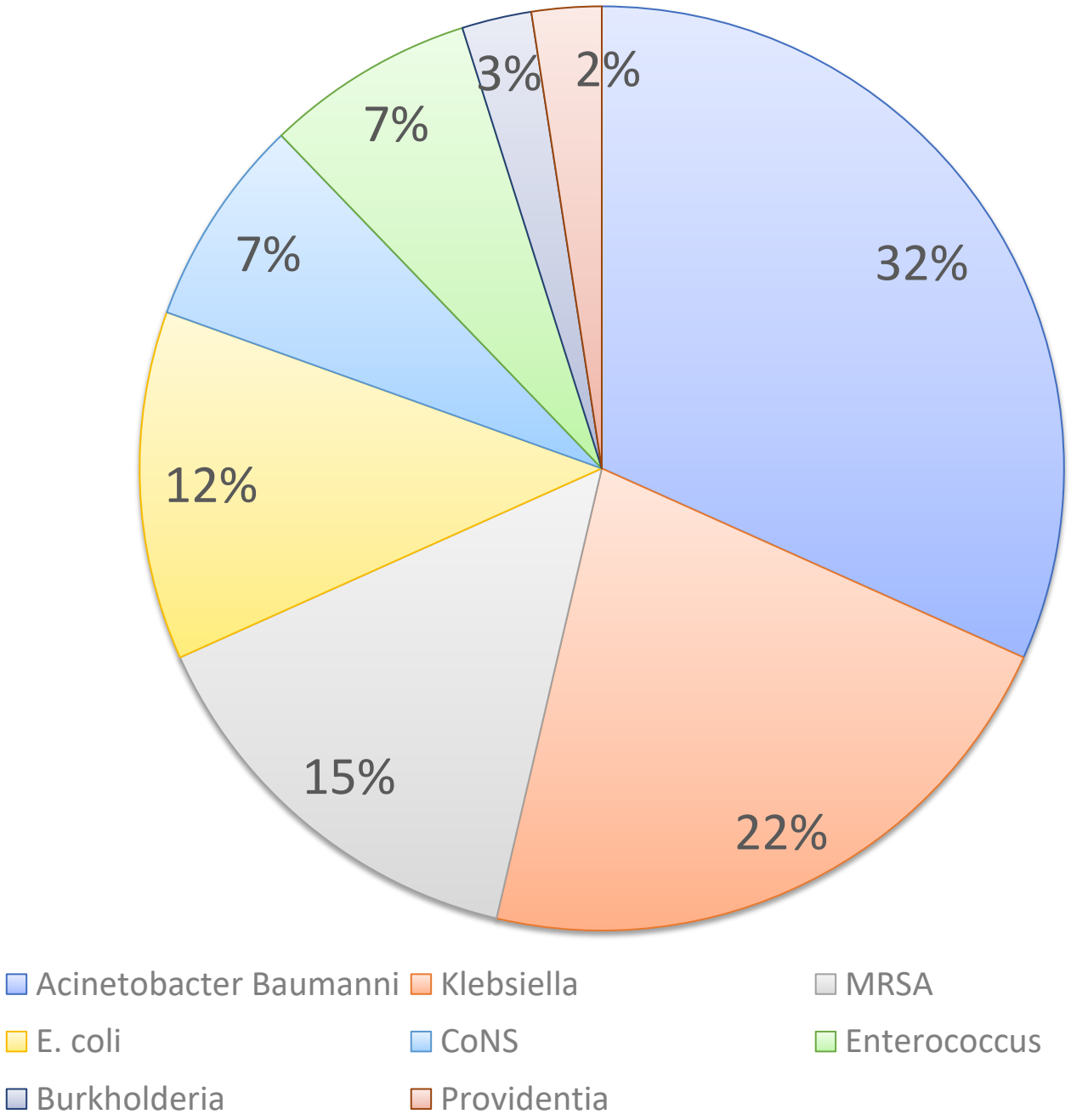
- For subsequent follow up SOFA score calculated on day 3 and day 7 of ICU stay suggest significant correlation with mortality (p-value < 0.001).
- APACHE / SAPS / SOFA scores were inversely related to admission duration (p-value = 0.005 / 0.004 / 0.003).
- For prediction of outcome between survivors and non-survivors APACHE score, SAPS score, SOFA score were statistically significant when calculated on day 1 of admission. (p-value < 0.001)


SOFA (Day 1)
10
9
8
7
6
5
4
3
2
1
0
5.4
9.2
Survived
Died
Outcome


SOFA at Outcome
13
12
11
10
9
8
7
6
5
4
3
2
1
0
4.0
12.0
Survived
Died
Outcome

RESULTS

- Out of 100 patients in our study population, 41 culture specimen had growth of microorganisms (received from 34 patients), this may be due to early antibiotics initiation.
- Most common organism isolated was *Acinetobacter baumanni* (32%), followed by *Klebiella Spp* (22%).
- In our study population, 41 cultures were positive for bacteria and 22 (53.7%) bacteria were carbapenem resistant.
- Majority (90.9%) carbapenem resistant bacteria were sensitive to colistin. This sensitivity difference was statistically significant (p-value < 0.001).


32%
22%
15%
12%
7%
7%
3%
2%
Acinetobacter Baumanni
Klebsiella
MRSA
E. coli
CoNS
Enterococcus
Burkholderia
Providentia

Comparison with National studies

SETUP	Number of Cultures	Carbapenem Resistance	Most common organism for resistance	Author
AFMC Pune	130	70 (53.84%)	*Enterobacter*	Atul K et al
CMC Vallore	460	56(12.2%)	*Pseudomonas*	Gladstone P et al
JIPMER Pondicherry	103	45(43.6%)	*K. pneumoniae*	Parveen RM et al
Chennai	50	22(44%)	*K. pneumoniae*	Ravikant P et al
MAMC	123	75(61%)	*A. baumannii*	Tempe DK et al
AIIMS Delhi	1209	456(37.7%)	*Pseudomonas*	Behera B et al

Comparison with International studies

SETUP	Number of Cultures	Carbapenem Resistance	Most common organism for resistance	Author
Greece	469	312 (66.5%)	*A. baumannii*	Georgios M et al
Iran	103	40 (38.83%)	*A. baumannii*	Josheghani SB et al
China	507	244(48.1%)	*K. pneumoniae*	Zeng L et al
Italy	182	50(27.5%)	*K. pneumoniae*	Montrucchio G et al

CONCLUSION

- ICU scoring system SOFA, qSOFA, APACHE II, and SAPS are proven scoring system for prognosis and outcome of critically ill patients with sepsis, one of the scoring systems should be implemented in ICU as per the availability of local expertise or resources.
- In our study, qSOFA score significantly correlated with SOFA score and mortality outcome, therefore in resource limited setting and peripheral ICU/HDU, qSOFA can be utilized in place of SOFA scoring which is more extensive and resource demanding.
- In our study, we documented high carbapenem resistance 53.7% (22/41). Carbapenem resistance was alarming and there appears to be an urgent need for strengthening antibiotics stewardship program.

THANK YOU