

Neutropenic Sepsis - Can we do Better?

M. Caruana Dingli¹, S. Cauchi¹, D.J. Camilleri¹, M. Borg¹, R. Abela¹

¹ Mater Dei Hospital, Msida, Malta



INTRODUCTION

Neutropenic sepsis is one of the most common causes of death amongst haem-oncology patients. Successful treatment is contingent on early administration of effective broad-spectrum antibiotics.

Local guidelines suggest the empiric use of piperacillin/tazobactam +/- gentamicin depending on the Multinational Association of Support in Cancer Care (MASCC) score and carbapenemase producing enterobacteriaceae status, in cases of febrile neutropenia.

Febrile Neutropenia is defined as a fever of $\geq 38.5^{\circ}\text{C}$ on one occasion or 38°C maintained over an hour or symptoms/signs of shock in a patient with a neutrophil count of $< 0.5 \times 10^9$ cells/L.

AIM

In this study we aimed to assess the most common causes of febrile neutropenia and their antibiotic sensitivities, so as to ascertain whether or not current the current recommend empirical treatment is optimal.

METHOD

- Two years' worth of admissions to the haematology ward in Sir Anthony Mamo Oncology Centre were recorded.
- Record was taken of the episodes in which positive blood cultures in neutropenic patients were noted.
- For each recorded episode, demographic data, haematological diagnosis, the resulting organism, and the antibiotic sensitivities were noted.

REFERENCES

- Clinical Practice Guidelines Mater Dei Hospital, Malta; 2019
- "Cultures in Neutropenic Fever", A Giotas, M Grech; 2014

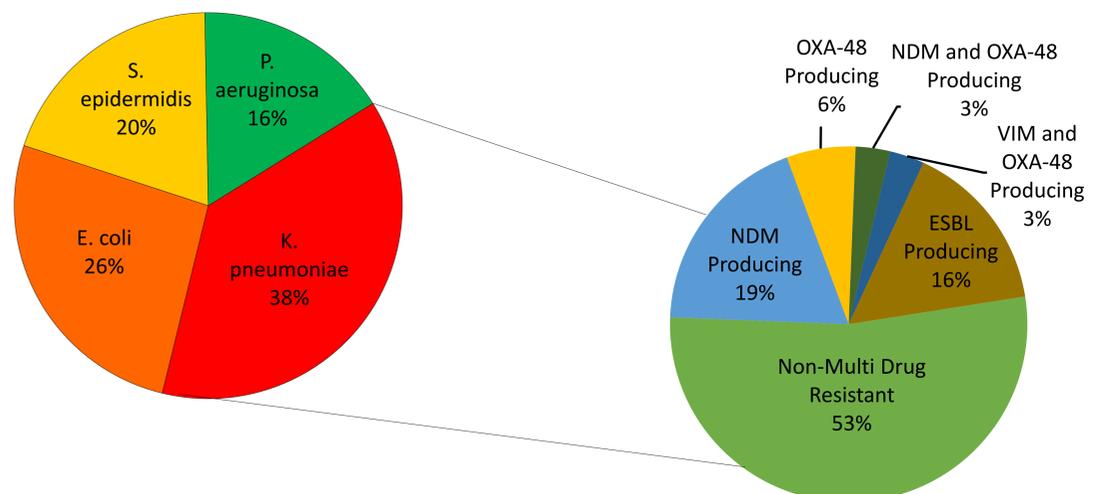
CONTACT INFORMATION

+356 99170141/mcd1326@gmail.com

RESULTS

- 72% of the cultured bacteria were gram negative, with *K. pneumoniae* being the overall commonest organism.
- 62% of cases were caused by *P.aeruginosa*, *K.pneumoniae*, *S.epidermidis*, and *E.coli*. The remaining 48% of cultures primarily consisted of organism with an incidence $< 3\%$, with only *E.faecium* and *S.aureus* occurring at a greater frequency (4% each).
- Amongst Gram negative organisms Piperacillin-tazobactam showed limited effectiveness when compared to Gentamicin and Amikacin.
- Amikacin held a slight advantage over Gentamicin (55% to 35%) in the treatment of Piperacillin-Tazobactam resistant *K.pneumoniae*.
- 100% of cases of *S.epidermidis* were sensitive to Vancomycin and Linezolid.

Most commonly Cultured Organisms



Antibiotic Sensitivities of the Top 3 cultured Organisms

	E. coli	K. pneumoniae	P. aeruginosa
Piperacillin-tazobactam	70.8%	36.3%	73.3%
Meropenem	100%	69.6%	66.7%
Gentamicin	95.8%	57.6%	80%
Amikacin	95.8%	66.7%	93.3%

CONCLUSIONS

- Compared to a previous study titled 'Cultures in Neutropenic Fever, the commonest organism has shifted from *E.coli* (34.2% -> 16%) to *K.pneumoniae* (17.6% -> 23%).
- Sensitivity of *K. pneumoniae* and *E.coli* to piperacillin-tazobactam has declined (65% to 36.3% and 90% to 70.% respectively). Amikacin has improved sensitivity in patients *K. pneumoniae* resistant to piperacillin-tazobactam compared to gentamicin.
- Gentamicin should be used first line with piperacillin-tazobactam if MASCC score is > 21 whilst amikacin should be used if score is < 21 .
- If gram positive cocci are seen on gram stain or gram positive infection is highly likely, addition of vancomycin is needed to cover for *S. epidermidis*.