Blood culture surveillance of Haemato-Oncology patients at the Beatson West of Scotland Oncology Centre

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BACKGROUND

Neutropenic sepsis can cause significant morbidity and mortality in Haemato-oncology patients and should therefore be treated promptly and effectively.

Immunity can be compromised by the malignancy itself or therapeutic interventions. Patients with haematological malignancies and cancers with bone marrow infiltration are at increased risk of infection. Bone marrow suppression commonly occurs as a result of chemotherapy and radiotherapy rendering the innate and adaptive immune systems dysfunctional (1). Mucositis with damage to the mucosal barrier is a frequent complication. These patients are therefore at higher risk of developing blood stream infection.

Empirical antibiotic guidelines are based on local surveillance data and can be adapted based on changes in susceptibility and antibiotic selection pressure.

Our current empirical antibiotic policy is depicted below:

First Line Empirical Antibiotics

Piperacillin-Tazobactam + *Gentamicin*

If penicillin allergic use *Meropenem*

If penicillin and carbapenem resistant use Ciprofloxacin + Gentamicin

Second Line Empirical Antibiotics

Antibiotics can be switched after 48-96 hours of therapy if evidence of clinical deterioration or cardiovascular instability to:

Meropenem

Gram positive cover

This should be added as a first line agent:

ONLY if a line infection is suspected, e.g. rigors/pyrexia with line use

OR if previous gram positive organism grown on blood cultures recently suggesting colonisation

OR evidence of skin/ soft tissue sepsis.

Use *Teicoplanin* or *Vancomycin*.

Anti-viral and PCP treatment should be considered.

Prophylactic treatment with fluoroquinolones of patients with profound neutropenia (Neut< 0.5 x 109/l) is advocated for preventing gram negative bacteraemia and has become standard preventative therapy in many oncology units. The development of fluoroquinolone resistance is a concern and recent literature suggests an increase in resistance amongst Enterobacteraciae within oncology units is becoming more common (3).

AIMS

Surveillance of blood culture isolates is important for Haemato-Oncology units to ensure local empirical antimicrobial prescribing remains effective.

POPULATION

The Beatson West of Scotland Oncology Centre has 3 Haemato-Oncology wards:

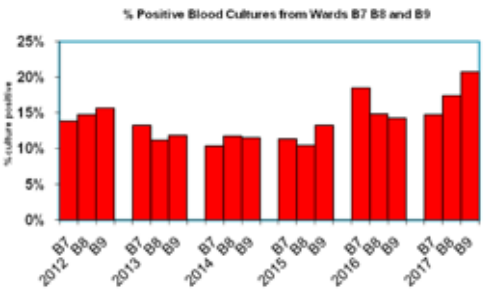
Ward B7- 19 bedded unit including 4 Teenage Cancer Trust beds. The majority of the patients admitted to this ward have leukaemia, lymphoma or myeloma.

Ward B8 - 10 bedded unit primarily for transplant patients. Approximately 70 allogenic transplants and over 60 autologous transplants are cared for in this ward per annum.

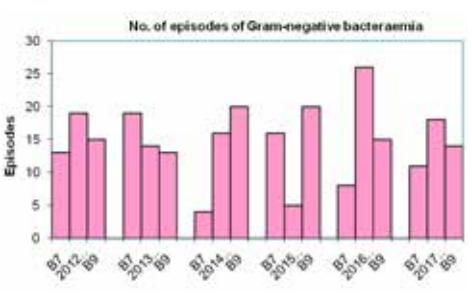
Ward B9 - 9 bedded unit with a significant population of post allograft patients in addition to patients with acute leukaemia, lymphoma and autologous transplants.

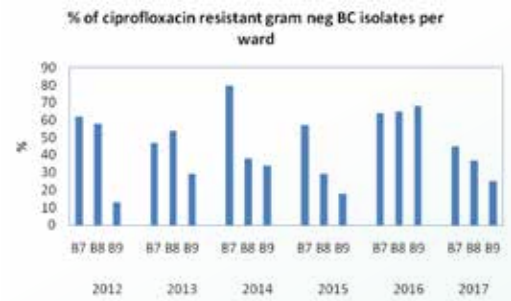
RESULTS

Blood Culture Data



Gram negative data

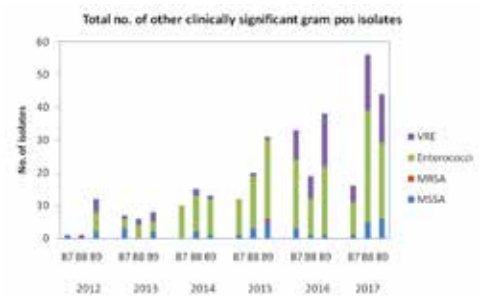


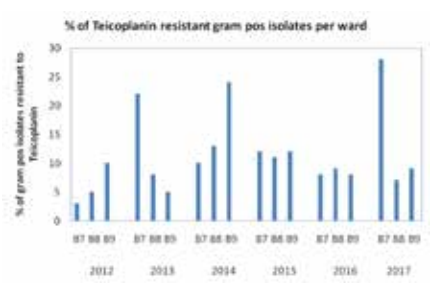


Meropenem Resistance:

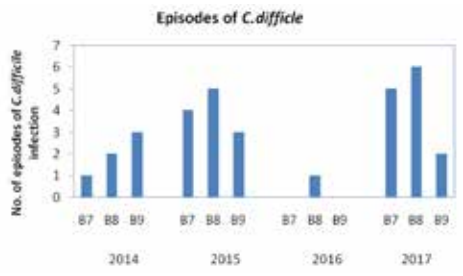
There were only 5 meropenem resistant isolates in the period of 2012–2017, never more than 1 per year.

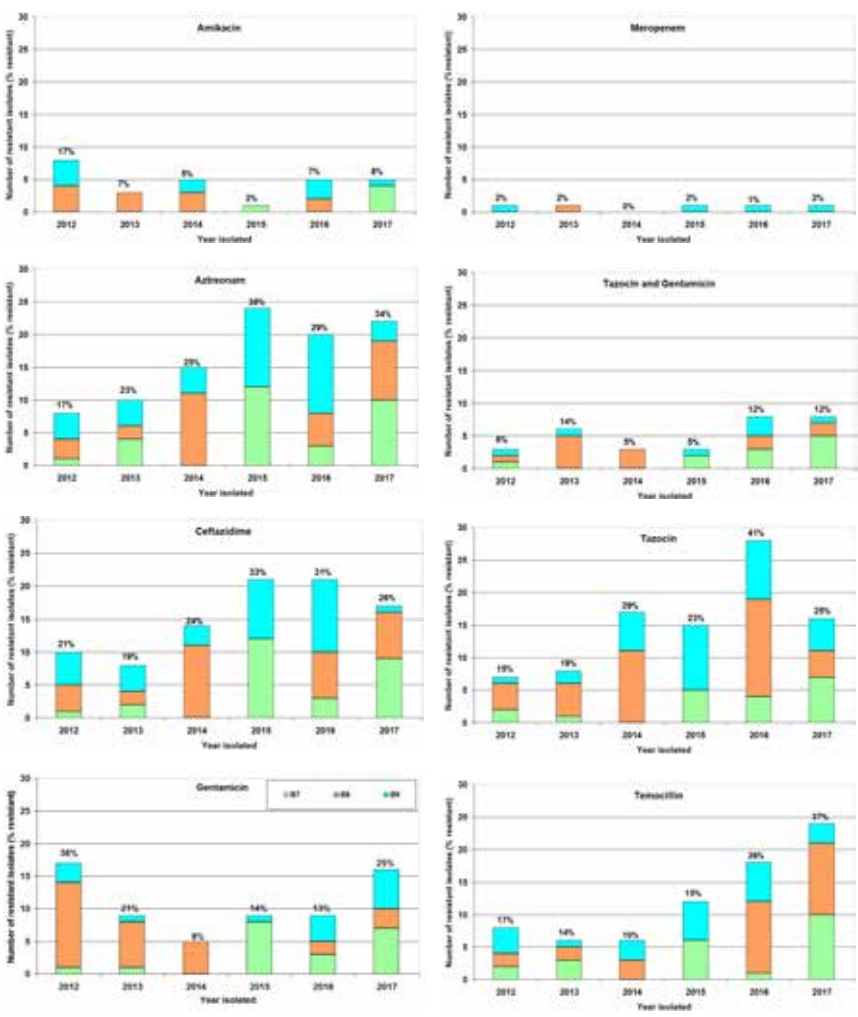
Gram positive data





C.difficile data





DISCUSSION

We have witnessed an increase in the number of blood cultures taken over the five year period reflecting better adherence to guidelines for neutropenic sepsis diagnosis.

Although the number of isolates is small, we have noticed an upward trend to piperacillin/ tazobactam resistance amongst our gram negative isolates.

Ciprofloxacin resistance amongst gram negative isolates has remained static throughout the five year period and is approximately 40%. This raises the question as to whether prophylaxis remains effective.

Roughly 10% of all CONS isolates are resistant to Teicoplanin. This needs to be considered when empirically starting Teicoplanin for possible line sepsis.

Worryingly the number of VRE isolates has been increasing with 32 seen in each of 2016 and 2017 raising the question as to whether screening should be considered on admission.

The incidence of candidaemias remains low which is encouraging.

The rates of *C.difficile* on the wards were not of concern, despite the use of prophylactic ciprofloxacin.

LIMITATIONS

Statistical analysis was unable to be performed as the numbers in this study were small.

CONCLUSION

Continuous surveillance of blood cultures in this high risk population is essential to monitor trends in resistance and ensure the empirical prescribing guidelines remain effective.

REFERENCES

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Kern, W, et al. Emergence of fluoroquinolone-resistant Escherichia coli at a cancer center. Antimicrobial Agents Chemotherapy. 1994, 38(4).

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