

Febrile neutropaenia

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James talks to Dr Ibrahim Tohidi about the management of febrile neutropaenia on the wards.

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About Dr Ibrahim Tohidi

Dr Tohidi is a Haematology Advanced trainee at Royal Prince Alfred Hospital and Concord Hospital. He is a Clinical Associate Lecturer at the University of Sydney, and a member of the [RACP](#) Working party for the use of stem cells in cerebral palsy. He graduated from the University of Newcastle with Distinction, and has a special interest in [cellular therapies](#) and blood banking.

Febrile Neutropaenia

With Dr Ibrahim Tohidi, Advanced Trainee in Haematology at Royal Prince Alfred Hospital/Concord Hospital and Clinical Associate Lecturer at the University of Sydney, New South Wales, Australia

Introduction

Neutropenic sepsis is a potentially fatal complication of anticancer treatment, with adult mortality rates ranging from 2-21%. Junior doctors are often called to see febrile oncology and haematology patients on the ward after hours, and it is important to know how to recognise a patient with febrile neutropaenia, and how to act.

What is the definition of febrile neutropaenia?

Moderate neutropaenia: 0.5-1.0 cells per nanolitre

Severe neutropaenia: <0.5 cells per nanolitre

Febrile: temperature of 38°C sustained for one hour, or a single temperature recording of $\geq 38.3^{\circ}\text{C}$

What is the cause of neutropaenia in oncology and haematology patients?

Chemotherapy and/or radiotherapy leading to bone marrow suppression

Occasionally the malignancy itself

When does febrile neutropaenia most commonly present?

Most commonly it will occur 7-11 days after chemotherapy

Case

You are called by the nursing staff on the ward to see a patient who has developed their first fever 8 days after having received their first cycle of chemotherapy.

1. Initial questions over the phone?

- What are the patient's vital signs?
- How are they different from baseline?
- Is this the first febrile episode?
- Is the patient already receiving medication to treat febrile neutropaenia?

2. When you arrive at the patient's bedside, they appear sweaty and unwell. What is your approach to the patient?

- **Initial assessment**
 - ABCDEFG
 - Typically the circulation is affected in septic shock.
 - Assess the circulatory status of the patient.
 - If it has been established that the patient is not in any immediate danger, proceed to look for a source of infection.
- **History**
 - Start with an open-ended question to elicit the primary concerns of the patient. (E.g. how do you feel?)
 - Then use a systematic approach to ask about infective symptoms from head to toe (headache, photophobia, neck stiffness, runny nose, sore throat, cough, etc.)
 - Don't forget to ask about rash!
- **Examination:**
 - Tailor examination to the history you have taken.
 - Be timely so that you can initiate antibiotics as soon as possible.

3. Should you conduct invasive procedures and examinations in febrile neutropaenic patients?

- Invasive examinations and ward procedures (e.g. PR exam, insertion of NGT, IDC) should be considered *contraindicated*.

- If you are concerned about the patient, consult the oncology or haematology registrar on call.

4. What are the most common causes of infection in patients receiving chemotherapy?

- Neutropaenic colitis – usually gram negative organisms.
- Cellulitis and line sepsis.

5. Investigations

- Blood cultures: peripheral as well as central (take a culture from each line and lumen).
- If ongoing fever despite antibiotics, repeat blood cultures.
- If not known to be neutropaenic: FBC, EUC, CMP, LFTs, LDH and uric acid.
- Additional cultures and radiology tailored to history and examination.

6. Management

- If neutropaenia has not yet been confirmed, but the patient is receiving chemotherapy and is within the window of bone marrow suppression (e.g. from day 6 after chemotherapy), commence empiric antibiotics immediately.
- Specific antibiotic guidelines differ between hospitals.
 - Locally we use tazocin 4.5g tds +/- gentamicin 4-5mg/kg daily.
 - If there is haemodynamic compromise, we replace gentamicin with amikacin 16-20mg/kg daily.
 - If there is concern about MRSA or the patient has a central line, we add vancomycin.

7. Does the patient require a new cannula to administer antibiotics?

- Not routinely, and only if it appears to be a source of infection.
- The most important thing is timely administration of appropriate antibiotics!

8. When should you escalate care?

- All first episodes of febrile neutropaenia should be reviewed by the medical registrar, and the oncology or haematology registrar on call should be informed regardless of how the patient looks and feels.
- If there is ongoing fever and there has been a change in the patient's condition, the patient should be reviewed by the medical registrar.
- If there is haemodynamic compromise despite attempt at fluid resuscitation (e.g. 2 L), request intensive care to review the patient.

Take home messages

- Escalate appropriately as above.

Reference

- Empirical therapy for febrile neutropaenia, Antibiotic guidelines, ETG complete November 2014

Related Podcasts

- [Private: Sepsis](#)
- [Identifying the sick patient](#)

Tags: #cellulitis,#chemotherapy,#Febrile Neutropaenia,#fever,#haematology,#infectious disease,#line sepsis,#neutropaenic colitis,#neutropenic sepsis,#oncology,#septic shock

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