

Febrile neutropenia

The nursing perspective

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10 februari 2012

Febrile neutropenia

The nursing perspective

Content

- What?
- Risk assesement
- Practice guidelines
- Prevention of infection
- Patient education
- Nursing care
- Take home message

Febrile neutropenia

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What:

Patients marked by

- *fever of 38°C or higher*
- *have a cold chill*
- *absolute neutrophil count (ANC) lower than 500/mm³.*

Who is at risk:

All patients receiving myelosuppressive chemotherapy

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Is a **life-threatening emergency**.

- About 70%-75% of deaths from acute leukemia
- About 50% of deaths in patients with solid tumors are related to infection secondary to neutropenia (*Nirenberg, Mulhearn, Lin, and Larsen 2004*).

Complications of febrile neutropenia often result:

- in chemotherapy dose reductions
- in therapy delays

→ can compromise treatment outcomes (*Crawford et al., 2008; Lyman, Dale, &*

Crawford, 2003; Lyman, Dale, Friedberg, Crawford, & Fisher, 2004).

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Risk Assessment

Risk models:

- *To predict outcomes who develop FN.*
- *Enable to identify the severity of FN.*

Risk factors:

→ Factors associated with increased risk for FN.

- Treatment related.
- Patient related.
- Cancer related.

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Multinational Association of Supportive Care in Cancer Risk Score Tool for Febrile Neutropenia

Dimension	Definition	Points Assigned
Burden of illness	Range from moribund to absence of signs and symptoms	0 = moribund to 5 = no signs or symptoms
Hypotension	Score if absent	5
Chronic obstructive pulmonary disease	Score if absent	4
Tumor type	Either solid tumor or hematologic malignancy without prior fungal infection	4
Dehydration	Score if absent	3
Patient location	Score if an outpatient	3
Age	Score if patient is younger than age 60	2

Note. Higher scores convey a lower risk of complications from febrile neutropenia. In the validation study (Uys et al., 2004), scores of 21 or more reflected lower risk of complications.

Note. Based on information from Klastersky et al., 2000.

Treatment related

- Previous history of severe neutropenia with similar chemotherapy
- Type of chemotherapy (anthracyclines and platinum-based regimens)
- Planned relative dose intensity greater than 80%
- Preexisting neutropenia or lymphocytopenia
- Extensive prior chemotherapy
- Concurrent or prior radiation therapy to marrow-containing bone

Patient related

- Older age
- Female gender
- Poor performance status
- Poor nutritional status (e.g., low albumin)
- Decreased immune function
- Open wounds or active tissue infection
- Comorbidities
 - Chronic obstructive pulmonary disease
 - Cardiovascular disease
 - Liver disease (elevated bilirubin, alkaline phosphatase)
 - Diabetes mellitus
 - Low baseline hemoglobin

Cancer related

- Bone marrow involvement with tumor
- Advanced cancer
- Elevated lactate dehydrogenase (lymphoma)

Risk Factors for Febrile Neutropenia

Note. Based on information from Dale, 2006; Djulbrgovic, 2006; Rolston, 2006; Schwartzberg, 2006.

Febrile neutropenia

The nursing perspective

Practice Guidelines

Several practice guidelines have been developed for FN.

(Infectious Diseases Society of America, The American Society of Clinical Oncology, NCCN, MASCC and The American Cancer Society)

The common language:

→ THE NEED FOR PROMPT INITIATION OF ANTI-INFECTIVE THERAPY *(Van Vliet M., et al, 2011)*



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Prevention of infection

Is identified as a nursing-sensitive patient outcome measure by the Oncology Nursing Society (ONS).

Interventions at the highest level of recommendation:

- Hand hygiene with soap and water or alcohol-based rubs.
- Gown by caring for pt with respiratory secretions.
- Closed windows in healthcare facilities.
- Restrictions for visitors with respiratory symptoms

<http://www.cdc.gov/>

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The nursing perspective

Prevention of infection

Effectiveness **has not yet been established** for several nursing interventions frequently delivered such as:

- **When entering the room of a neutropenic pt, routine use**
 - gowns
 - gloves
 - masks
- **Diet modification**
- **Laminar airflow** for preventing infection in patients with cancer

(Hayes-Lattin et al. , 2005)

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Prevention of infection

The findings can help focus attention on interventions with maximum benefit to patients!

eg.

instead of strict enforcement of isolation procedures for inpatients



nurses can ensure that patients and families properly demonstrate **good hand hygiene**



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Patient education

Oncology nurses play a vital role in providing chemotherapy side-effect education to:

- patients
- their caregivers

Patient education includes teaching about:

- the potential of neutropenia
- the consequences of neutropenia
- preventive measures to decrease the risk of infection
- signs and symptoms of infection
- what to do when signs and symptoms occur

(Nirenberg, A., et al. , 2006)

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Patient education

However!

Wide variations exist in what patients are taught, and few evidence-based protocols are available to guide nursing practice and patient education in this area.

Although!

National patient guidelines and educational materials have been produced by the American Cancer Society and NCCN (2006), the American Society of Clinical Oncology (2006), and the Wellness Community, not all are evidence based.

→ suggestions for preventing infection.

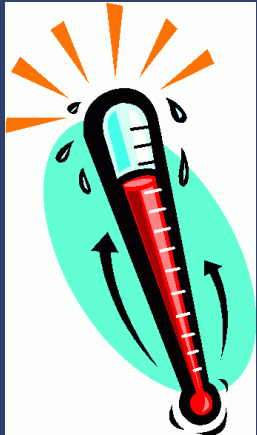
(Nirenberg, A., et al. , 2006)

Febrile neutropenia

The nursing perspective

Patient education

Eg. What should nurses teach patients about temperature?



report a temperature of 100.5°F or greater (American Cancer Society & NCCN, 2006; American Society of Clinical Oncology, 2006; Wellness Community, n.d.)?

single oral temperature reading higher than 100.9°F or an oral temperature higher than 100.4°F that lasts for more than an hour) (Hughes et al., 2002) defined by NCCN(2005) and the Infectious Diseases Society of America

➔ **Need for uniform information!**

Febrile neutropenia

The nursing perspective

NURSING CARE OF PATIENTS WITH FN

Assesement :

- General condition
- Complaints / symptoms (patient behavior)
- Timing of last chemotherapy treatment
- Current medications
- Comorbid diseases

Patients treated in the early stages have a good chance of survival. Once in the late stages there is an 80% chance of death!

Febrile neutropenia

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NURSING CARE OF PATIENTS WITH FN

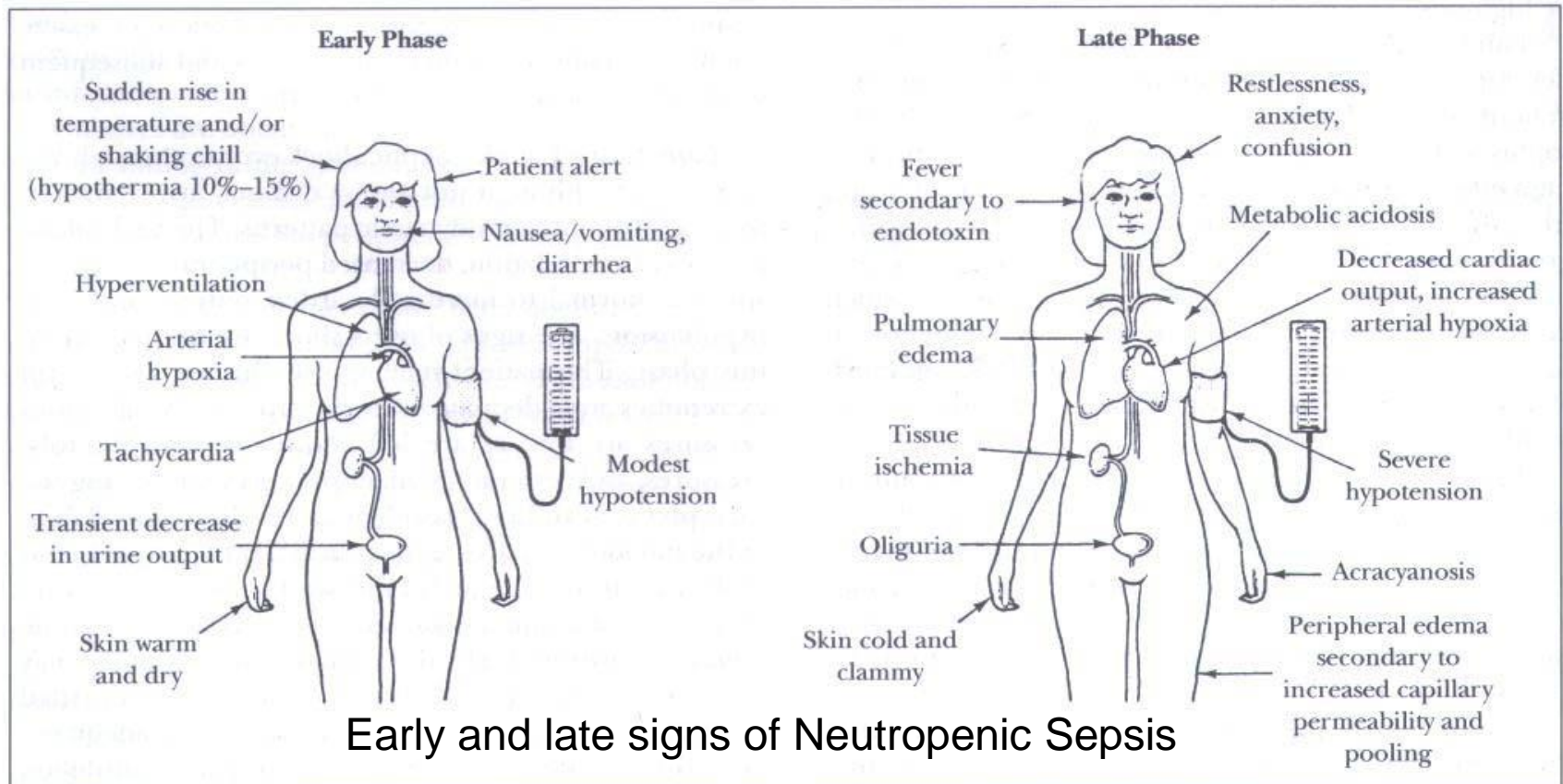
Clinical examination :

- Vital signs: Blood pressure, heart rate, breathing, t °, saturation, diuresis
- Check skin and possibly skin defects (dressings always open it!)
- Oral inspection
- Control catheter insertion point ! Often only minimal redness, sensitivity, swelling, ..
Cave! with blocked catheter: infected clot
- Control of anal region. DO NOT measure rectal examination or rectal temperature → introduction wounds, risk surinfections, bleeding, ...

Febrile neutropenia

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NURSING CARE OF PATIENTS WITH FN



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NURSING CARE OF PATIENTS WITH FN

Early and late signs of neutropenic Sepsis

	Early	Late
Temp	?low grade pyrexia ? Shakes/chills	Febrile
Skin	Flushed/warm	Cold/clammy, mottled skin
Cardio	Tachycardia, normal or low BP	Hypotension, peripheral oedema, DIC
Renal	Low output	No output
Pulmonary	Hyperventilation	Pulmonary oedema
CNS	Alert/mild confusion, apprehension	Restless/anxious/ confusion/lethargy/ coma
GI	Nausea/vomiting/ diarrhoea	Haematemesis/melena/ pr bleed

Febrile neutropenia

The nursing perspective

NURSING CARE OF PATIENTS WITH FN

Cultures:

- Blood cultures for fever $> 38^{\circ}\text{C}$
 - Repeat with remaining fever 1x/24 hours
 - At each temperature peak
 - Always at shivering
 - Peripheral and through each lumen of the catheter
- Urine culture
- Throat culture
- Stool culture
- Wound culture

**Before the start of AB but
may not involve loss of
time!**

Febrile neutropenia

The nursing perspective

H.E.A.T

History : has patient been on chemo/how long ago?

Examine

Action: 30 mins for FBC, get Antibiotics prescribed

Treat : Antibiotics + Fluids within 60 minutes of arrival

A Preventable Death - An Educational Film

<http://www.sussexcancer.nhs.uk/home/>

Febrile neutropenia

The nursing perspective

Take home message

Collaboration between care providers is an essential factor in the treatment of febrile neutropenia. → **MULTIDISCIPLINARY COLLABORATION**

Patients with febrile neutropenia in emergency service should be immediately seen to be closely monitored!

Hospitalized haematological patients with fever, should always be evaluated immediately!

The development of an infection in the presence of neutropenia can be fatal in a matter of hours. → **TIME**

If not properly managed, neutropenia in the hematology setting can have a devastating effect on quality of life. → **MANAGEMENT**

Febrile neutropenia

The nursing perspective

Take home message

Febrile neutropenia is:

History – **E**xamine – **A**ction – **T**reat



Rapid diagnosis, treatment and good nursing care may stop a **PREVENTABLE DEATH**

Febrile neutropenia

The nursing perspective

Thank you!

Questions?



Febrile neutropenia

The nursing perspective

Sources

Nirenberg, Mulhearn, Lin, and Larsen, 2004

Crawford et al., 2008; Lyman, Dale, & Crawford, 2003; Lyman, Dale, Friedberg, Crawford, & Fisher, 2004)

Van Vliet M., et al, 2011

<http://www.cdc.gov/>

<http://www.sussexcancer.nhs.uk/home/>

American Cancer Society & NCCN, 2006; American Society of Clinical Oncology, 2006

Hughes et al., 2002 defined by NCCN(2005) and the Infectious Diseases Society of America

The Oncology Nursing Society (ONS)