Neutropenic Diet: Standardizing the Practice Using Evidence-Based Practice Methods

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- 10 week summer research experience for undergraduate students from New Hampshire schools
- Christina Martin, an Inpatient Hematology/ Bone Marrow Transplant Nurse Practitioner: Norris Cotton Cancer Center at Dartmouth-Hitchcock Medical Center
Patients in the Norris Cotton Cancer Center report inconsistent information regarding neutropenic diet recommendations.

Unclear role of diet in the development of infection in patients with neutropenia.

Variation in dietary restrictions.

Provider instructions differ.
Neutropenia is a low level of neutrophils (type of WBCs).
- Varied definitions (ex: ANC<500, ANC<1000)

Neutrophils fight infection by destroying harmful bacteria and fungi or yeast that invade the body.

People who have neutropenia have a higher risk of developing serious infections.

Chemotherapy may cause neutropenia that can last a couple of days or sometimes weeks.
Historically, restrictive neutropenic diets were used to minimize the risk of acquiring infections through food in at risk groups.

1960’s neutropenic diet emerged as part of “total protective environment” for leukemia patients with prolonged neutropenia.

Most transplant centers use some type of neutropenic diet (Smith, 2000; August, 2009).
Patients prescribed a neutropenic diet have been shown to have poor nutritional status.

As a result of the restrictive diet, some patients even require supplementation via total parenteral nutrition.

Quality of life

Many restrictions for this population have been lifted, however use of the neutropenic diet has continued in practice despite limited evidence.
PROCESS: OVERVIEW

- IRB not required

- Using the **Iowa Model of Evidence-Based Practice**:
  - Developed a PICO question
  - Assembled & critiqued relevant research
  - Reviewed potential survey tools
PROCESS: OVERVIEW

- **P (Patient Population or Problem)**
  - Norris Cotton Cancer Center Health Care Providers

- **I (Intervention)**
  - Staff education regarding standardized neutropenic diet guidelines

- **C (Comparison with Other Treatments)**
  - Staff knowledge of neutropenic diet guidelines prior to education

- **O (Outcomes)**
  - Knowledge of standardized neutropenic guidelines as measured by knowledge survey pre- and post-intervention
Literature Review Conclusions

- There is NO evidence to support benefit of restrictive neutropenic diets for patients with neutropenia.

  - No difference in the rates of febrile admissions or positive blood cultures between compliant vs. non-compliant patients. (DeMille, 2006)

  - Infection rates not significant between groups who followed vs. those who did not follow diet restrictions. (Moody, 2006)

  - Retrospective review of 726 transplant patients: higher rate of infection in recipients who followed a neutropenic diet. (Trifilio, 2012)

  - Meta-Analysis: Found no difference in major infection or mortality rates between ND and RD groups (Sonbol, 2015)
Literature Review Conclusions

- Educate on safe food handling practices & hand washing
  - Primary cause of food-borne illness is unsafe handling of foods
  - Focus on safe food handling practices for patients with neutropenia to help reduce exposure to food-borne pathogens

- FDA Food Safety for People with Cancer
  - Preferred because less restrictive, better adherence
PROJECT GOALS

- Perform a Pre-survey to NCCC providers to better understand individual professional practice
- Identify current practices regarding neutropenic precautions
- Standardize the practice and education around neutropenic diets for cancer patients of the Norris Cotton Cancer Center
  - Put information together and give education to staff on findings
RESEARCH QUESTION

- What are the current best-evidence recommendations regarding neutropenic diet?

- What is current practice around neutropenic diet at the Norris Cotton Cancer Center?
  - Who is put on a Neutropenic Diet?
  - What does the diet include/exclude?
  - Where (Differences among locations)?
  - When is Neutropenic Diet initiated/discontinued?
  - How is the information being gathered/distributed?
METHODS

- 9-item survey adapted with permission by Dr. Arno Mank and Michelle Davies (2008)

- Survey link was emailed to NCCC Health Care Providers stating “Please complete the survey about your beliefs and practices regarding dietary advice for patients with cancer”

- The completion of the survey was considered consent to participate
METHODS

- Surveyed NCCC healthcare providers on
  - Different practices regarding what food items are restricted for patients with neutropenia and what different names they call this special diet
  - At what point in the patient’s treatment might restrictions be implemented/discontinued
  - What might account for differences amongst practitioner/practice settings
REDCAP SURVEY RESULTS

- 60 responses consisted of 77% Nurses, 2% Dietitians, 13% Associate Providers, 7% Physicians, and 1% “Other”

- Individual practice of neutropenic diet precautions varies among providers

- Results support assumptions regarding inconsistent neutropenic diet instructions

- Standardized and up to date education is needed for staff

- The data will guide the work of standardizing education for NCCC providers
REDCAP SURVEY RESULTS

Where do you work? (Choose all that apply.)

- 1 West HSCU
- 1 West MHO
- Lebanon 3K Clinic
- Lebanon 3K Infu...
- Research
- Lebanon Radiati...
- Manchester
- Nashua
- St. Johnsbury

What is your profession?

- Nurse
- Dietician
- Associate Provider
- Physician
- Other
REDCap Survey Results

**What do you typically call a diet for immunocompromised patients?**

- Neutropenic Diet: 44
- Low-Bacterial Diet: 0
- BMT Diet: 11
- Food Safety Guidelines: 22
- Other: 33

**Which patients do you believe should receive information about a low bacterial diet? (Choose all that apply.)**

- All patients receiving...: 33
- Bone marrow an...: 44
- Patients who hav...: 20
- Patients who hav...: 30
- All patients with c...: 10
- Other: 0
REDCap Survey Results

When do you teach patients about low bacterial diet? (Choose all that apply.)

- At hospital adm.
- Upon diagnosis
- When patient or...
- During chemo...
- During first che.
- When labs indic...
- Upon hospital d.
- No specific poin.
- Unsure
- Never
- Other

If you teach patients about a low bacterial diet, what specific foods do you caution against?

- All raw fruits an..
- Pasteurized yo...
- Well water
- Raw fruits and ...
- Deli meats
- Soft cheeses
- Raw or unpaste...
- Restaurant food
- Fast food
- Other
REDCap Survey Results

If you teach patients about low bacterial diet, when do you instruct patients that it is OK to discontinue following these guidelines?

- When chemotherapy
- Based on lab values
- I typically do not
- Whenever all immune
- 100 days following
- When prophylaxis
- At hospital discharge
- Other

If you’ve taught patients about low bacterial diet, where have you gotten your information? (Choose all that apply.)

- Formal professors
- Conferences
- Journals
- Internet
- D-H dietitian
- D-H medical provider
- Pamphlet
- Peers
- Other
REDCap Survey Results

**When did you last receive information on food safety guidelines for cancer patients?**

- Within the last year: [Bar Chart]
- Within the past year: [Bar Chart]
- Within the past five years: [Bar Chart]
- More than five years: [Bar Chart]
- Never: [Bar Chart]
- Unsure: [Bar Chart]
Survey Conclusions

- Supports assumptions and patients’ feedback about inconsistent messages.
- Demonstrates that updated education is needed for staff.
- Oncology patients are being taught different information at different times.
- Some advice given to patients is unnecessarily restrictive.
Improvement Plan

- Remove inconsistent written education from eDH
- Periodic update of FDA Food Safety Guidelines for the Patient with decreased Immune Function booklet
- Standardize education to NCCC interdisciplinary team members
SAFE FOOD HANDLING FOR
GENERAL ONCOLOGY POPULATION

**CLEAN**
WASH HANDS AND SURFACES OFTEN

**SEPARATE**
SEPARATE RAW MEATS FROM OTHER FOODS

**COOK**
COOK TO THE RIGHT TEMPERATURE

**CHILL**
REFRIGERATE FOOD PROMPTLY

KEEP YOUR FAMILY SAFER FROM FOOD POISONING
Check your steps at FoodSafety.gov
NCCC CURRENT PRACTICES:

- Outpatient NCCC dietitians educate BMT patients on food safety guidelines and reinforce safe food handling practices in general oncology population.
  - These recommendations have **not** changed and **are** based on the most current evidence as evidenced by our literature review conclusions.
- Inpatients are placed on a “Neutropenic diet/BMT diet” in eD-H when ANC is <500.
  - Similar to regular hospital diet
  - Differences from regular diet:
    - Steamed deli meats
    - No chicken salad (prepared at an outside facility).
  - Minimally restrictive
BEST PRACTICE:

- Educate **general oncology patients** on safe food handling.

- Can share FDA Food Safety for People with Cancer with **general oncology patients**.
  - Higher/lower risk foods.
  - Recommendations, not restrictions.

- Educate **BMT patients and those with prolonged low ANC levels** on higher and lower risk foods based on FDA food safety guidelines, with focus on hand washing and safe food handling/preparation.
  - Written information may include Food Safety Guidelines for the Patient with Decreased Immune Function for BMT patients or FDA food safety guidelines handout for cancer patients.
NEXT STEPS:

- Remove inconsistent written education from eDH (ex: handout with rec to peel fruits and vegetables)
- Periodic update of Food Safety Guidelines for the Patient with Decreased Immune Function booklet- NCCC Nutritionists working on now
- Standardize education to NCCC interdisciplinary team members
  - Include in orientation
  - Periodic refreshers
FRUITS AND VEGETABLES

Lower Risk:
FRUITS AND VEGETABLES

Higher Risk:
DAIRY/EGGS

Lower Risk:

- Yogurt
- Scrambled eggs
- Extra Sharp Cheddar Cheese
- Cream Cheese
DAIRY/ EGGS

Higher Risk:
MEAT, POULTRY, FISH

Lower Risk:
MEAT, POULTRY, FISH

Higher Risk:
BREAD, GRAINS, CEREALS

Lower risk:

Higher risk:

- Mixing or kneading any bread product containing yeast
- Raw grain products
WATER AND BEVERAGES

Lower Risk:
- Bottled water
- Boiled water
- Lipton tea

Higher Risk:
- Well water
- Loose leaf tea
FUTURE RECOMMENDATIONS

- Consult DHMC dietitians to meet with any oncology patient to educate on Food Safety Guidelines/safe food handling practices if needed.

- We will continue to monitor Pre- and post- patient satisfaction survey results.

- Standard monitoring infection rates from common food-borne illnesses in our neutropenic population as compared to prior to our intervention.
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REFERENCES


