Management of Febrile Neutropenia and Application of the Clinical Index for Stable Febrile Neutropenia Tool in a Retrospective Cohort of Breast Cancer Patients

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BACKGROUND

Solid-tumor patients are presumed to have high rates of infection and antibiotic exposure due to their immunocompromised state; however, there is a paucity of real-world data describing the management of solid tumor patients presenting to emergency departments (EDs) with signs and symptoms of infection during the active treatment phase

OBJECTIVE

1. To describe febrile neutropenia (FN) presentation, management patterns, and outcomes in retrospective sample of breast cancer patients presenting to the Sunnybrook Health Sciences ED
2. To evaluate the accuracy of the CISNE tool for predicting risk of FN complication

METHODS

Breast cancer patients who received curative anthracycline- and/or taxane-based chemotherapy between August 2013 and July 2019 and visited the Sunnybrook Health Sciences Centre ED during the active treatment phase were identified from institutional databases

Demographic, treatment, and clinical information was extracted from electronic medical records for each FN ED encounter. CISNE scores were calculated for each FN ED encounter

- Parameters: ECOG performance status ≥2 (2 points), blood glucose ≥6.7 mmol/L (or 13.9 mmol/L in diabetics or on steroids) (2 points), COPD (1 point), cardiovascular disease history (1 point), NCI mucositis grade ≥2 (1 point), monocytes <200/μL (1 point)
- Total score 0 (low risk), 1-2 (intermediate risk), or ≥3 (high risk) of complication

FN ED encounter characteristics, CISNE performance (clinical outcomes of inpatient complication and return to ED within 30 days), and chemotherapy management outcomes were descriptively summarized

RESULTS & DISCUSSION

66/1259 (5%) patients identified had an FN event during the active treatment phase; 72 FN ED encounters from these patients had a full CISNE data set

Table 1 summarizes the FN ED encounter characteristics. Table 2 summarizes clinical outcomes (inpatient complication, return to ED within 30 days) among inpatient and outpatient cases of low, intermediate, and high risk of complication. Table 3 summarizes chemotherapy management outcomes for the entire sample

Poor performance of the CISNE tool for predicting complication or return to ED within 30 days

Limitations: Single centre (patients, ED encounters), liberal FN definition to maximize cases, limited documentation regarding key parameters (ECOG score, mucositis, past medical history), liberal definition of complication to maximize cases, ambiguity in predictor and outcome variable definitions in CISNE development cohort, poor performance in breast cancer patients in development cohort

CONCLUSION

FN was an infrequent occurrence in breast cancer patients receiving curative cytotoxic chemotherapy. The subjective nature of CISNE parameters and retrospective reporting bias may limit tool accuracy when applied to early-stage breast cancer patients

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RESULTS

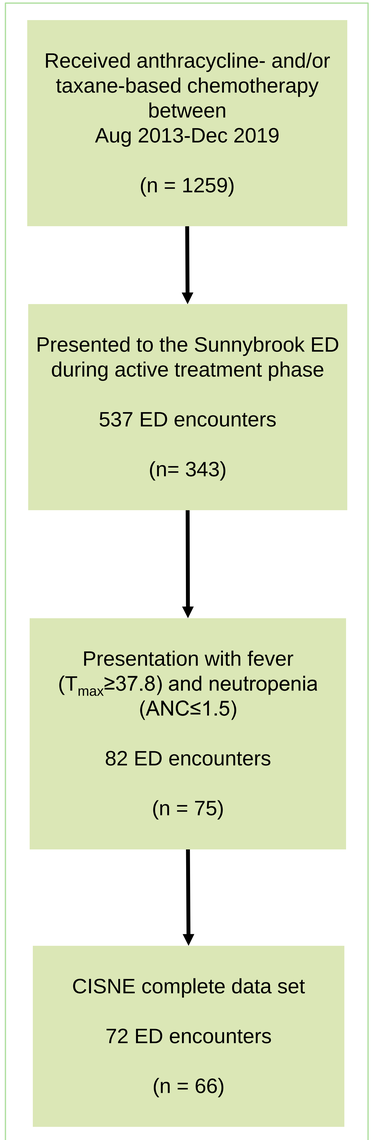

Figure 1. Consort-style diagram describing the identification process for 72 FN ED encounters with a complete data set (*n, number of patients)*

Table 1. Characteristics of the 72 FN ED encounters with complete CISNE data

	n	*%*
Female	71	99%
Median age (range)	55	(33-74)
Stage 0-II	42	58%
Stage III	7	10%
Unknown	23	32%
Filgrastim G-CSF	28	39%
Pegfilgrastim G-CSF	36	50%
No G-CSF	8	11%
2013 - 2015 calendar year	23	32%
2016 - 2017 calendar year	25	35%
2018 - 2019 calendar year	24	33%
Anthracycline cycle	52	72%
Taxane cycle	20	28%
Cycle 1	42	58%
Cycle 2	2	3%
Cycle 3	7	10%
Cycle 4	15	21%
Cycle ≥5	6	8%
Cycle day 1-5	6	8%
Cycle day 6-10	57	79%
Cycle day 11-15	4	6%
Cycle day >15	5	7%
CISNE low risk	17	24%
CISNE intermediate risk	39	54%
CISNE high risk	16	22%
Inpatient disposition	55	76%
Median length of stay (range)	4 days	(1-12 days)
Outpatient disposition	17	24%

Table 2. Clinical outcomes (inpatient complication, return to ED within 30 days) among low, intermediate, and high risk CISNE FN ED encounters stratified by inpatient / outpatient disposition

	CISNE Risk Category		Inpatient Complication		Return to ED within 30d	
	n	*%*	*n*	*%*	*n*	*%*
Inpatient	55	--	13 / 55	(24%)	13 / 55	(24%)
Low risk	12 / 55	(22%)	5 / 12	(42%)	1 / 12	(8%)
Intermediate risk	30 / 55	(55%)	6 / 30	(20%)	7 / 30	(23%)
High risk	13 / 55	(24%)	2 / 13	(15%)	5 / 13	(38%)
Outpatient	17	--	N/A	--	3 / 17	(18%)
Low risk	5 / 17	(29%)	N/A	--	0 / 5	(0%)
Intermediate risk	9 / 17	(53%)	N/A	--	3 / 9	(33%)
High risk	3 / 17	(18%)	N/A	--	0 / 0	(0%)

Table 3. Chemotherapy management outcomes following discharge for the 72 FN ED encounters

	n	*%*
Delay next chemotherapy cycle	19	26%
Dose reduction next chemotherapy cycle	45	62%
10% dose reduction	1	2%
15% dose reduction	7	16%
20% dose reduction	8	18%
25% dose reduction	5	11%
Dose reduction, unknown magnitude	21	47%
Return to SHSC ED within 30 days	16	22%
Within the current chemotherapy cycle	7	10%
In the subsequent chemotherapy cycle	11	15%

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DISCLOSURES

Authors have the following to disclose concerning possible personal or financial relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:

Guirguis M – Nothing to disclose
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