

Applying Multinational Association of Supportive Care of Cancer (MASCC) index score for identifying febrile neutropenia patients at high risk of complications presenting at a tertiary care hospital in Pakistan

Zarka Samoon, Madiha Beg, Munira Shabbir-Moosajee
Aga Khan University Hospital, Karachi, Pakistan

BACKGROUND

Febrile Neutropenia (FN) is a medical emergency which requires hospitalization and antibiotic treatment. Multinational Association of Supportive Care of Cancer (MASCC) index score is a clinical tool to predict outcomes in FN patients. This risk index score has been validated in international trials however local data is not available. Our aim was to determine hospital based incidence rate of serious complications in admitted chemotherapy induced febrile neutropenia patients presenting to a tertiary care hospital. Also, we compared proportions of serious complications in patients having MASCC score < 21 or ≥21 hence substantiating MASCC score usage in our population.

METHODS

A hospital based prospective close cohort study was designed and conducted at the Oncology wards of The Aga Khan University from February to August 2014. Total of 88 patients, aged 16 and above, with chemotherapy induced febrile neutropenia were identified. They were divided on basis of MASCC score into low or high risk {exposure} groups. We followed them from day of admission (day zero) to the time they were discharged. Outcome was assessed in terms of development of serious complications. Hospital based incidence rate with 95% Confidence Interval was estimated.

The associations between outcome and qualitative variables were evaluated by using Pearson Chi-square and Fisher's exact test.

Table 1: MASCC risk model

Prognostic Factor	Weight
Burden of febrile neutropenia illness: no or mild symptoms (less than two organ symptoms, not requiring intervention)	5
No hypotension	5
No chronic obstructive pulmonary disease	4
Solid tumor or no previous fungal infection (in patients with haematological malignancies.)	4
No dehydration	3
Burden of febrile neutropenia illness: moderate symptoms (more than two organ systems or less than two organ systems but requiring intervention)	3
Outpatient status	3
Age <60 years	2

*A score of ≥21 is defined as low risk and <21 as high risk.



Table 2: Baseline characteristics based on Low and high risk MASCC group

Characteristics	High risk	Low risk
Number of patients n(%)	75 (85.2%)	13 (14.8%)
Median age in years (range)	48 (17-75)	53 (18-63)
Gender		
Male	42 (56%)	7 (54%)
Female	33 (44%)	6 (46%)
Tumor		
Solid	34 (45.3%)	5 (38.5%)
Haematological tumors	41 (54.7%)	8 (61.5%)
Mean Haemoglobin gm/dl (range)	9.73 (6.1-18.1)	9.62 (8-11.4)
Absolute Neutrophil Count (cells/μL)		
<100	62 (82.7%)	10 (76.9%)
>100	13 (17.3%)	3 (23.1%)
Mean Platelet (range) (cells/μL)	99 (1-500)	67 (3-227)

Table 3: Rate of Serious complications

Serious complications [n(%)]	High risk (n=75)	Low risk (n=13)
Hypotension	9	-
Respiratory failure	8	-
ICU admission	3	-
DIC	1	-
Confusion	3	-
CCF	2	-
Bleeding	2	-
Renal failure	4	-
Death	9	-

Table 4: Factors associated with serious complications.

Variable	Serious Complications Yes	No	Test Statistic	p value
Age				
<60	9	58	4.256	0.039 ~
>60	7	14		
Gender				
Male	8	41	0.256	0.613 ~
Female	8	31		
Tumor				
Solid	8	31	0.256	0.613 ~
Heme	8	41		
Albumin*				
<2.5	3	5	6.137	0.046 ~
>2.5	8	21		
ANC				
<100	15	57	---	0.285 §
>100	1	15		
MASCC				
≤15	6	4	---	0.002 §
>15	10	68		
Microbiology				
Positive	4	18	7.243	0.404 ~
Negative	11	55		
G-CSF use				
Yes	12	64	2.144	0.143 ~
No	4	8		

RESULTS

Hospital based incidence rate of febrile neutropenia admission was 5.98% , 95%CI [4.88%-7.08%] and hospital based incidence rate of serious complications was 18.2%, 95%CI[11.5%-25%]. Out of 88 patients with chemotherapy induced febrile neutropenia 85.2% patients were in the high risk group and 14.8% in the low risk group. Serious complications were found in 21.33% and no patients in high and low risk group respectively. Age > 60, MASCC score <15 and an albumin <2.5 mg/dl was associated with a higher chance of developing serious complications. Sensitivity, specificity, positive and negative predictive value of MASCC score in accurately predicting risk of serious complications was 21.33%, 100%, 100% respectively.

CONCLUSION

MASCC risk-index score is a useful tool to identify patients at low risk of complications. Our hospital based incidence rate of serious complications was 18.2%.

KEY WORDS: Febrile neutropenia, chemotherapy, serious complications