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NURSING

RISK FOR FEBRILE NEUTROPENIA AMONG PATIENTS UNDERGOING CHEMOTHERAPY

Dr. Thenmozhi. P* Associate Professor, Saveetha College Of Nursing, Simats, Chennai, Tamilnadu
*Corresponding Author

Nishanthi. D B.sc (n) Iv Year, Saveetha College Of Nursing, Simats, Chennai, Tamilnadu

ABSTRACT

Introduction: Febrile Neutropenia is a rapid decline in absolute neutrophil count is developed in response to the effects of chemotherapy in seven to fourteen days after treatment which increase the morbidity and mortality of patients receiving chemotherapy. Hence the study was conducted with aimed to assess the level of risk for febrile neutropenia among patients undergoing chemotherapy.

Materials and Methods: Descriptive study design was employed with 100 samples who matched the inclusion criteria were selected by convenience sampling technique. Demographic variables were collected by using multiple choice questionnaires followed by MASCC (Multinational Association for Supportive Care in Cancer) FN risk index score scale were used to collect data to assess the level of risk for febrile neutropenia. The data were tabulated and analyzed by descriptive and inferential statistics.

Results: The finding of the study reveals that 58% were on high risk for febrile neutropenia and 42% were on low risk for febrile neutropenia.

Conclusion: special precautions to be followed prevent the infection along with administration of biological therapies to boost the immune system. Educate the health care personnel regarding febrile neutropenia risk assessment and its management.

KEYWORDS : Febrile Neutropenia, Chemotherapy, Cancer, Myelosuppressive, Mascc Fn Risk Index Score Scale.

INTODUCTION:

Cancer is a non-communicable disease which has major public health concern. The number of new cases of cancer is 439.2 per 100,000 men and women per year and is expected to rise to 23.6 million by 2030 [1]. Cancer is the second leading cause of death globally and is about 1 in 6 deaths due to cancer. It is responsible for an estimated 9.6 million deaths in 2018 and the number of cancer deaths is 163.5 per 100,000 men and women per year [2]. Approximately seven million cancer deaths that occur worldwide and 70% of these are in low and middle-income countries [3] despite there is an advancement of treatment modalities. The most commonly used treatment for cancer is surgery, radiation therapy and chemotherapy. Chemotherapy or cytotoxic drug is a group of drugs which kill the tumor cells or control the growth the abnormal cells. Though advances in treatment and prevention, mortality rates in patients with cancer and febrile neutropenia can range from 5% to 20%. Higher mortality rates are associated with patients who have higher occurrences of infectious complications and more co-morbidity [4].

Febrile neutropenia is a serious side effect of many forms of chemotherapy which increases the risk of infection, and is typically signaled by fever [5]. Febrile neutropenia (FN) is defined as fever as a single oral temperature ≥38.3°C (101°F) or a temperature ≥38.0°C (100.4°F) lasting more than 1 hour, and defines neutropenia as an absolute neutrophil count (ANC) <500 cells/mm [3,6]. Patients with neutropenia or low neutrophil counts are predisposed to serious and life- threatening infections because of their immune system's impaired ability to mount inflammatory responses to bacteria, fungi, yeast [7,8]. The risk of developing FN depends on the degree and duration of chemotherapy-induced neutropenia and on a number of patient factors, including age, comorbidity and serum albumin levels [9]. It is associated with significant morbidity and mortality, and can lead to a decision to reduce or delay subsequent chemotherapy doses, which can have implications for treatment efficacy [10]. In patients having solid tumors, the incidence of febrile neutropenia ranges from 10%-50% and is apparently ≥80% in patients having hematological malignancies [11]. Neutropenia patients are prone to suffer from infections, with respiratory tract infection (35%–40%), bloodstream infections (15%–35%) and urinary tract infections (5%–15%) being most common [12]. Febrile neutropenia risk assessment is to be a routine assessment in the clinical practice to prevent and control the infection related to febrile neutropenia. Hence the study was conducted with the aim to assess the level of risk of FN among patients receiving chemotherapy.

MATERIALS AND METHODS:

Hospital based cross sectional study was conducted after obtaining formal permission from the oncology ward of selected hospital with 100 samples. Samples who met the inclusion criteria were selected by using non probability convenience sampling technique. Participants who were receiving chemotherapy in 4th cycle or more and consented to participate in the study were included whereas critically ill, mentally disturbed, known case of neutropenia and who do not understand Tamil or English were excluded from the study. The patients who consented for willing to participate were explained about the purpose of the study and informed consent was obtained. Confidentiality of the responses was ensured. Demographic variables were collected by interview method by using multiple choice questionnaires followed by assessed the level of risk of febrile neutropenia. The level of risk of febrile neutropenia was assessed by using MASCC (Multinational Association of Supportive Care Centre) risk index score scale which is a reliable and valid scale [13-17]. The maximum score is 26. A score of ≥ 21 is considered low risk and a score of < 21 as high risk. The data were tabulated and analyzed by descriptive and inferential statistics. Chi-square test was used to test the association between the demographic variable and risk of neutropenia. $P < 0.05$ was taken as statistically significant.

RESULT

The findings of the current study reveal that majority of the samples were in the age group of 50 years & above and 56% were male. 43% were on the 4-6 cycle of chemotherapy and high percentage of cancer has been treated by chemotherapy were solid tumor which is around 77% and they had the comorbidity problem of renal diseases (32%) and Cardiovascular diseases (22%).

Table 1: Frequency and Percentage distribution of level of risk of FN

Level of Risk of FN	Frequency (n)	Percentage
High risk	58	58%
Low risk	42	42%

The above Table 1 reveals that 58% were on high risk for febrile neutropenia and 42% were on low risk for febrile neutropenia as per the MASCC risk index score scale

Table 3: Frequency and Percentage Distribution of Mean and Standard Deviation of level of risk for FN

	Mean	Standard deviation
Overall	19.56	2.54
High Risk	18.97	2.35
Low Risk	19.86	1.95

The overall mean and standard deviation of level of risk for febrile neutropenia among patients receiving chemotherapy is 19.56 and 2.54. The mean and standard deviation of high risk and low risk for febrile neutropenia are 18.97±2.35 and 19.86±1.95.

Chi-square test reveal that there is no significant association between

the demographic variables and the level of risk for febrile neutropenia at the level of $p<0.05$.

DISCUSSION:

Febrile neutropenia is one of the life threatening complications in cancer patients undergoing chemotherapy resulting in emergent admission and hospitalization which is a stressful experience for patients and a burden to health care systems. The main focus of this study was to assess the level of risk for FN among patients undergoing chemotherapy. The current study findings reveal 58% were on high risk for febrile neutropenia and 42% were on low risk for febrile neutropenia as per the MASCC risk index score scale among patients receiving chemotherapy. The finding of this study is consistent with the study conducted by Mateti U V et al., who observed that out of 200 patients, 19 patients developed 22 episodes of CIFN. The higher incidence of CIFN has been observed among male gender (57.89%), age group between 45-60 years (52.63%), stage III patients (42.10%), solid tumor (73.68%) and double chemotherapy regimen (59.1%) [18]. In present study also found that male gender as well solid tumor is more risk for febrile neutropenia. However this study limits to confirm the febrile neutropenia by doing the investigation. Another study conducted by Aagaard T et al who observed that among 6294 patients in the derivation cohort, 360 developed febrile neutropenia. Compared with those at low risk, the incidence rate ratio of developing FN was 4.8, 8.7 and 24.0 in the intermediate, high and very high risk groups, respectively [19]. Similarly Hashiguchi et al who demonstrated that Chemotherapy-induced neutropenia occurred in 147 (50.5%) patients over 378 chemotherapy cycles and febrile neutropenia occurred in 20 (6.9%) patients over 25 (1.5%) cycles. The current study observed risk for developing febrile neutropenia induced by chemotherapy by the effect of myelosuppression. Takashi Ishikawa, et al who proved that Japanese female breast cancer patients receiving neo-adjuvant and adjuvant chemotherapy regimens are potential for febrile neutropenia. Hence this study is recommended to assess the other parameters related to FN and associate with relevant clinical variables.

CONCLUSION:

The finding of the current study concluded that the risk of FN is found among patients receiving chemotherapy. Hence special precautions to be followed prevent the infection along with administration of biological therapies to boost the immune system. Educate the health care personnel regarding FN risk assessment and its management.

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CONFLICT OF INTEREST

Author declares no conflict of interest.

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