

# Oncologic Emergencies That Need Supportive Care In ICU

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## Abstract

Patients with oncologic disease have numerous complications that are life- threatening and may require hospitalisation in the intensive care unit. If not recognized and treated appropriately, these complications can be fatal. We reviewed all 840 patients admitted to medical intensive care unit of GATA Haydarpasa Training Hospital during one - year period. 75 (8.9%) oncologic patients with 140 oncologic emergency episodes that needed supportive care were documented. Thirty one (22.1%) emergency episodes were related to gastrointestinal system (bleeding, obstructive icter, ascites, peritonitis, intractable vomiting), 23(16.4 %) respiratory system (pneumonia, obstructive dyspnea ), 22 (15.7%) hematopoietic system (neutropenia, anemia, pancytopenia, disseminated intravascular coagulation), 19 (13.5%) genitourinary system (obstructive renal insufficiency, acute tumour lysis syndrome, severe electrolyte abnormalities, nephrotoxicity, urosepsis), 14 (10%) nervous system (organic brain syndrome, convulsion, seizures, pain ) 10 (7.1%) multiorgan failure, sepsis) 9 (6.4 %) cardiovascular system (superior vena cava syndrome, hypotension, dysrhythmia, cardiotoxicity) 5 (3.5%) malnutrition, 2 (1.4 %) exfoliative dermatitis and 5 (3.5%) were undiagnosed. Quality of life could be improved in 48 (64%) patients with appropriate supportive care and 30 (40%) patients were referred to oncologic therapies after supportive care. Our mortality rate was 36% in this population. We conclude that with appropriate medical and nursing management, these emergencies can be either prevented or their complications minimised.

## INTRODUCTION

Cancer is a kind of disease that one suffer from its worsening effect on the life comfort much more than its shortening the life time. Oncologic emergencies are life-threatening complications that can be presented during the course of the disease or related to the therapeutic modalities of the malign diseases. If they were diagnosed and treated immediately, improve in the quality of life can be obtained. After the oncologic emergency was treated there could be a chance for the treatment of primary malignancy such as surgery, radiotherapy and / or chemotherapy. The objectives of this study were to determine our hospital utilisation of ICU facilities and the prospects of a successful outcome in cancer patients with need for supportive care.

## MATERIAL AND METHOD

All clinical and laboratory data were collected retrospectively from ICU Archive Service in 2000. The patients who were followed by oncology department as an inpatient or outpatient status or patients who were taken to the ICU with the first attack of an oncologic emergency were enrolled to the study. The demographic features of patients, the involved systems with emergency episode and the results

of the episode - such as mortality, improve in quality of life and chance to continue to the primary therapy- were documented.

## RESULTS

We reviewed all 840 patients admitted during a one-year period, focusing on the patients receiving supportive care. There were 75 (8.9%) patients treated with supportive care. 42 males and 33 females were included . The median age was 62,3 ( range 20-85) years. There were 19 genitourinary, 17 gastrointestinal, 14 hematologic ,10 lung, 7 breast, 2 brain , 2 bone and 4 other malignity in this series. 40 (53%)of 75 cases had metastatic and 35 (47%) had local disease. Metastatic cases were with 16 (21%) hepatic, 15 (20%) cerebral, 8 (11%) bone, 6(8%) lung and 4 (5%) with periton involvement (Table-I).

**Figure 1**

Table 1: Characteristics of cancer patients

|                              | N            | %  |
|------------------------------|--------------|----|
| Number of patients           | 75           |    |
| Number of emergency episodes | 140          |    |
| Median age ,range            | 62.3 (20-85) |    |
| Male                         | 42           |    |
| Female                       | 33           |    |
| Local Disease                | 35           | 47 |
| Metastatic disease           | 40           | 53 |
| Liver                        | 16           | 21 |
| Brain                        | 15           | 20 |
| Bone                         | 8            | 11 |
| Lung                         | 6            | 8  |
| Periton                      | 4            | 5  |

We described 140 oncologic emergency episodes in this population. Thirty one (22.1%) emergency episodes were related to gastrointestinal system (bleeding, obstructive icter, ascites, peritonitis, intractable vomiting), 23 (16.4 %) respiratory system (pneumonia, obstructive dyspnea ), 22 (15.7%) hematopoietic system (neutropenia, anaemia, pancytopenia, disseminated intravascular coagulation), 19 (13.5%) genitourinary system (obstructive renal insufficiency, acute tumour lysis syndrome, severe electrolyte abnormalities, nephrotoxicity, urosepsis), 14 (10%) nervous system (organic brain syndrome, convulsion, seizures, pain ) 10 (7.1%) multiorgan failure, sepsis) 9 (6.4 %) cardiovascular system (superior vena cava syndrome, hypotension, dysrhythmia, cardiotoxicity) 5 (3.5%) malnutrition, 2 (1.4 %) were exfoliative dermatitis and 5 (3.5%) were undiagnosed respectively (Table-II).

**Figure 2**

Table 2: Range and Results of the Oncologic Emergency Episodes

|  | Emergency Episodes no | Improve in Quality of Life no | Death no  | Primary Oncologic Therapy, no |
|--|-----------------------|-------------------------------|-----------|-------------------------------|
| Gastrointestinal System                | 31                    |                               |           |                               |
| Bleeding,                              | 9                     | 6                             | 3         | 4                             |
| Obstructive icter                      | 5                     | 5                             |           | 1                             |
| Ascites,                               | 8                     | 8                             |           |                               |
| Peritonitis                            | 5                     | 4                             | 1         |                               |
| Intractable vomiting                   | 4                     | 4                             |           |                               |
| Respiratory system                     | 23                    |                               |           |                               |
| Pneumonia                              | 11                    | 9                             | 2         | 2                             |
| Obstructive dyspnea                    | 7                     | 5                             | 2         | 3                             |
| Pleuresia                              | 5                     | 5                             |           |                               |
| Hematopoietic system                   | 22                    |                               |           |                               |
| Neutropenia                            | 8                     | 6                             | 2         | 3                             |
| Anemia                                 | 9                     | 9                             |           | 3                             |
| Pancytopenia                           | 3                     | 3                             |           | 1                             |
| Disseminated intravascular Coagulation | 2                     | 1                             | 1         |                               |
| Genitourinary system                   | 19                    |                               |           |                               |
| Obstructive renal insufficiency        | 6                     | 6                             |           | 2                             |
| Acute tumour lysis syndrome            | 2                     | 1                             | 1         |                               |
| Severe electrolyte abnormalities       | 3                     | 2                             | 1         | 1                             |
| Nephrotoxicity                         | 4                     | 4                             |           | 1                             |
| Urosepsis                              | 4                     | 3                             | 1         | 1                             |
| Nervous system                         | 14                    |                               |           |                               |
| Organic brain syndrome                 | 3                     | 3                             |           | 1                             |
| Convulsion                             | 2                     | 2                             |           |                               |
| Seizures                               | 2                     | 2                             |           |                               |
| Pain                                   | 7                     | 7                             |           | 3                             |
| Cardiovascular system                  | 9                     |                               |           |                               |
| Superior vena cava syndrome            | 2                     | 2                             |           | 1                             |
| Hypotension,                           | 3                     | 2                             | 1         | 1                             |
| Dysrhythmia,                           | 2                     | 1                             | 1         |                               |
| Cardiotoxicity                         | 2                     | 2                             |           | 1                             |
| Malnutrition ( Cachexia)               | 5                     | 3                             | 2         |                               |
| Multiorgan failure, sepsis             | 10                    | 3                             | 7         |                               |
| Exfoliative dermatitis                 | 2                     | 2                             |           | 1                             |
| Undiagnosed                            | 5                     | 3                             | 2         |                               |
| <b>TOTAL</b>                           | <b>140</b>            | <b>113</b>                    | <b>27</b> | <b>30</b>                     |

113 (80%) of the 140 oncologic emergency could be treated and improve in the quality of life was observed. But the other 27 (20%) cases did not respond to the therapy and were died. 30 (40%) patients of the former group could be given oncologic treatment later.

## DISCUSSION

Intensive care is increasingly being used in the management of cancer patients. Emergencies in oncologic patients are common and diverse. Almost every cancer patient will develop at least one emergency situation at the beginning of in the further course of his disease(1). Oncologic emergencies can be grouped in to the following categories: neurologic, cardiopulmonary, metabolic, hematologic, infectious, gastrointestinal, genitourinary and infusion-related (2).

Among the hospitalised, cancer patients are the most common patients with malnutrition. Anorexia, insufficient food intake, obstructive lesions and hormonal abnormalities are most major causes of the malnutrition in cancer patients.

Cashectin (TNF) and other cytokins (IL-1, INF) which were released by macrophage in cancer patients have catabolic effects (<sub>3,4</sub>). Oesophagus, stomach, pancreas and lung cancer are the most prominent causes of weight loss among cancers and non-Hodgkin lymphoma, colon and prostate are other causes. Malnutrition and cancer cachexia are the main cause of the mortality about 5- 25 % in cancer patients (<sub>5,6</sub>). No data was found that balanced and well-selected nutritional support does promote cancer progression. So that nutritional support is essential for cancer patients to improve the quality of life. 5 patients who had malnutrition according to the Global Subjective Determination (GSD) scale were given balanced nutritional support of 40 Kcal/kg/ day, with 1.5 gr/kg protein. Performance status was better in three patients and they were discharged but two of them were died. Symptomatic malign pleural effusions should be treated by systemic chemotherapy in chemo-sensitive tumours such as small cell lung cancer, breast cancer, lymphoma or ovarian cancer. In other non-chemo sensitive malignancies including non-small cell lung cancer, water sealed tube drainage and pleurodesis is the standard treatment of choice in most of the cases.

Instead of the former standard drug tetracycline, doxycycline has been frequently used. Talc slurry has been accepted and counted as one of the standard choices in the western countries, however it usually needs general anaesthesia and adverse effects are not negligible. Other anti tumour drugs instillation, thoraco-abdominal shunting and pleuro-pneumectomy should be considered experimental because of the lack of randomised trials (<sub>7</sub>). Systemic chemotherapy was administered in three patients and tube drainage and pleurodesis were applied in two patients with malign pleural effusion. We also treated the patient immediately by pericardiocentesis under the cardiac echographic guidance who had cardiac tamponade due to non-Hodgkin lymphoma. The best method for the treatment of the pericardial malign effusion would be pericardiocentesis alone, percutaneous continuous drainage, pericardial fenestration or pericardio-thoraco fenestration.

Raised intracranial pressure may be a life-threatening presentation of a brain tumour (<sub>8</sub>). There are multiple causes often play a role in the development of mental status changes in advanced cancer. 14 patients with advanced disease developed neurologic complications in our series. The most frequent complaint were related to pain and others were organic brain syndrome and convulsions.

Respiratory or circulatory failure may arise from compression of the superior vena cava or airway. Superior vena cava obstruction is considered an oncologic emergency commonly associated with lung carcinoma. The syndrome of DIC is serious hypercoagulation state and its acute form may be life threatening in cancer patients. Prompt recognition and emergency treatment are necessary to help minimise morbidity and mortality (<sub>9</sub>). Adenocarcinomas may be cause of DIC due to tissue invasion, tissue factor releasing, leukocyte activation or direct activation of the prothrombinase with tissue or specific cancer procoagulant (<sub>12</sub>).

The acute tumour lysis syndrome (TLS) is a rare condition that has most frequently been documented in patients with rapidly dividing myeloproliferative and lymphoproliferative malignancies. It is characterised by the development of hyperuricemia, hyperkalemia, hyperphosphatemia, hypocalcemia, acute renal failure and metabolic acidosis as a result of massive tumour cell destruction, usually secondary to effective cytotoxic treatment. In our series we had TLS and one of them who died from cardiorespiratory arrest during combination chemotherapy can be cause of potentially fatal oncologic emergency. So these patients should be monitored strictly.

Lymphoma patients are at increased risk for the development of the following oncologic emergencies: superior vena cava syndrome, cardiac tamponade, sepsis, acute tumour lysis syndrome and increased intracranial pressure. If not recognised and treated quickly these complications can be deadly (<sub>10</sub>).

In many cancer patients, in many stages of the disease, it's possible to see the pain syndrome in all stages from the last to the unbearable degrees (<sub>11</sub>). Anger, depression and anxiety are often together with cancer pain. Although very high dose narcotic analgesic some patients may suffer from pain. In these cases we combined adjuvant therapy such as antidepressive or anticonvulsive with analgesic drugs to remove the pain. We treated cancer pains according to WHO criteria's and used patient control analgesia in 4 of all 7 cases, which suffer from cancer pain.

Hypercalcaemia occurs in 10% to 20% of patients with cancer at some time during the disease course. Parathyroid hormone related protein is the most common mediator of humoral hypercalcaemia of malignancy, while local osteolysis is the principal mechanism in patients with bone metastasis (<sub>13</sub>). We could control hypercalcaemia hydration

with saline and administration of calcitonin and furosemid in one patient with bone metastasis. Hyponatremia with an increase in total-body salt and water content , manifested as oedema and/or ascots, is the most common electrolyte abnormality in cancer patients . Hyponatremia due to salt depletion may occur in patients who receive cisplatin. The syndrome of inappropriate antidiuretic hormone secretion may occur in association with cancer of the lung, after high-dose cyclophosphamide, and during vigorous fluid administration in patients with chemotherapy-associated emesis.

Doxorubicin and paclitaxel are highly active agents in the treatment of advanced breast cancer. But unexpectedly high incidence of congestive heart failure had been reported due to anthracycline induced myocardial injury<sup>(14)</sup>. We had two cardiotoxic patient with advanced breast cancer treated with doxorubicin. Their ejection fractions were very low due to myocardial injury. We could improve cardiac functions with dobutamin infusion. In order to minimise cardiac risk, patients should be selected carefully and monitored for adverse cardiac events.

In conclusion, almost every cancer patient will develop at least one emergency situation at the beginning of in the further course of his disease. If not recognised and treated quickly, these complications can be fatal. With appropriate medical and nursing management, these emergencies either can be prevented or their complications minimized. If the emergency episode treated, improve in quality of life and chance to continue to the primary therapy such as surgery, chemotherapy and radiotherapy can be obtain.

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