Journal Homepage: - www.journalijar.com
INTERNATIONAL JOURNAL OF ADVANCED RESEARCH (IJAR)
Article DOI: 10.21474/IJAR01/9753
DOI URL: http://dx.doi.org/10.21474/IJAR01/9753
ISSN NO. 2320-5407

RESEARCH ARTICLE

CURATIVE CHEMOTHERAPY FOR INTUBATED PATIENTS. SHOULD WE?.

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Manuscript Info

Manuscript History
Received: 12 July 2019
Final Accepted: 14 August 2019
Published: September 2019

Key words:-
chemotherapy , intensive care unit , intubated patient.

Abstract

Introduction: The management of patients with cancer, presenting an immediate life-threatening risk is a complex and controversial subject. The admission of those patients to the care unit poses a real dilemma, we are torn between the desire to go to the limits of technical possibilities especialy for young patients.
Materials and methods: We report 4 cases of patients, admitted in intensive care unit for respiratory distress causes by a tumor. These patients were intubation because of hypoxemia, and then received curative chemotherapy in the intensive care unit.
Discussion: A few years ago, admission to intensive care unit for onco-hematology patients was unthinkable. It still is nowadays, we are torn between the desires to go to the limits of technical possibilities especialy for young patients. A study of ICU admissions for any type of lung carcinoma (80% of Non-Small Cell Bronchial Cancers) shows that of the 22,538 patients in stages III-IV, 16360 leave the hospital and 4,889 survive at 6 months. Only 11% of mechanically ventilated patients leave the hospital. In our study, one of the four patients treated with chemotherapy responded well, a ratio of 25%.
Conclusion: Admission decisions of patient with neoplasia to the ICU should be made on a case-by-case basis, somewhere between the two ends of the decision-making spectrum, based on the clinical evaluation and after discussions with the oncologist and patient

Introduction:-

Management of patients with cancer, presenting immediate life-threatening risks is a complex and controversial subject. The admission of those patients to the care unit poses a real dilemma, as the clinician is torn between the desires to go to the limits of technical possibilities especialy for young patients [1]

Patients with cancer prognosis during their stay in intensive care is mainly conditioned by acute physiological disturbances induced by complications in the patient's stay in intensive care [2-3]. However, after recovery, the prognosis is again determined by the cancer characteristics. This fact has been shown in both, the general oncological population [4] and in specific populations of patients having a cancer requiring invasive mechanical ventilation [5]

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Materials and methods:-

We report 4 cases of patients, admitted in intensive care unit for tumor-induced respiratory distress.

These patients were intubated because of hypoxemia, and then received curative chemotherapy for there cancer in the intensive care unit.

Results:-

Case 1

Miss I.T, age 16, followed for a non-Hodgkin's lymphoma, presented dyspnea with cervical and mediastinal compressive adenopathies on the chest CT (**Fig1).** Admission to the intensive care unit for respiratory distress required the use of mechanical ventilation. The patient was intubated and put in controlled volume mode.
Pressure increase to 100 mmHg with persistence of hypoxemia was the main motif. Afterward, the decision to start a chemotherapy was made, marked by the improvement of the respiratory function. A thoracic CT scan showed a clear improvement of the images in **fig 2.** Patient was extubated after 6 days.

Case 2

Mrs. N.B, 26 years old, followed for a non-Hodgkin's lymphoma type B with cervical and medial adenopathies on the Chest (**fig 3).** The patient had already received chemotherapy without significant improvement in the time of diagnosis.

She wad admitted later on to the intensive care unit for respiratory distress few days later, and intubated for refractory hypoxemia. We took the decision to perform chemotherapy because of her young age and after discussion with oncologists. The evolution was marked by the installation of febrile neutropenia, evolving towards a septic shock, then death of the patient the same day.

Case 3

Mrs. F G. 28 years old, followed for a non-Hodgkin lymphoma with mediastinal adenopathies on chest CT causing respiratory distress. After her admission to the intensive care unit, she benefited of a non-invasive ventilation, but because of the non-improvement of her respiratory status, it was decided to intubate the patient and perform chemotherapy.Unfortunately, the patient died the following day due to refractory hypoxemia.

Case 4

Mrs. N F, aged 32, followed for a lung adenocarcinoma.The patient was admitted to the care unit for management of respiratory distress, there was no pneumothorax on the chest CT scan. The patient benefitted from non-invasive ventilation but without any improvement of her respiratory status, so it was decided to intubate the patient after a discussion with the oncologist and to perform curative chemotherapy. The evolution was marked by the death of the patient 2 days later because of refractory hypoxemia.

Discussion:-

Should we admit onco-hematology patients in intensive care?

A few years ago, admission to intensive care unit for onco-hematology patients was unthinkable. However, with the evolution of knowledge and therapeutic advances that have improved the prognosis of those patients, especialy the use of growth factors, new chemotherapy molecules and non-invasive ventilation [6, 7]. Nowadays, the admission of those patients to the care unit still a real dilemma, we are torn between the desire to go to the limits of technical possibilities especialy for young patients [1]

Cancer chemotherapy [8, 9]

Chemotherapy provides a curative option malignant cells of the primary tumor and micrometastatic cells resulting in in improvement of palliative care, disease free survival, long-term survival, or cure. Chemotherapy may be given alone or in combination with other chemotherapy or given concurrently or sequentially with radiation therapy. It can be administered in the neoadjuvant (prior to surgery), adjuvant (after surgery), and metastatic setting depending on the patient's disease status. Chemotherapy interferes with cellular proliferation and replication that occurs at an accelerated pace.

This process, however, is not selective only for malignant cells. Chemotherapy may be classified as cell cycle

specific including; G1-phase, S-phase, G2-phase, or mitosis and cell cycle non-specific. As cells progress through the replication phases, chemotherapy agents may interfere by means of protein disruption, deoxyribonucleic acid (DNA) replicating enzyme interference, and the insertion of false base pairs (**fig4).**

Chemotherapy with various mechanisms of actions and non overlapping dose limiting toxicities are used in combination to provide disease free survival and long term survival. Due to metabolic and elimination pathways such as those involving metabolism via the cytochrome P450 system, clinicians should be aware of potential concurrent inhibitors and inducers with commonly used medications in the ICU that may result in adverse events excess.

Chemotherapy in intensive care, why not? what risks?
In addition to a delayed effect, which appears only after a few days, performing a chemotherapy session in intensive care is fraught with many risks including the risk of infection, by reducing immunity (neutropenia / care-related infection) and colonization by nosocomial germs. This chemotherapy is the cause of several incidents, mainly hematological, cardiac, renal and lung toxicity. [6, 7]

Place of chemotherapy for cancer patients admitted to the intensive care unit:
There is very little data showing the usefulness of chemotherapy when a patient with cancer is admitted to intensive care. In a retrospective study of 51 patients with solid tumors with acute respiratory failure requiring invasive mechanical ventilation during chemotherapy [10], ICU mortality was of 68%.

In a small group of 20 newly diagnosed small cell bronchial carcinoma cases that were admitted to intensive care units [11], five intubated and ventilated patients were treated with chemotherapy. Two of these patients responded to chemotherapy and were extubated 4 days later. Both patients were alive and without tumor recurrence 7 months later. In contrast, non-chemotherapy patients all died within 40 days. Some patients with Small Cell Bronchial Cancers may therefore have long-term survival after chemotherapy treatment instituted at the time of admission to a resuscitation unit. These data highlights the potential value of administering chemotherapy in intensive care for treatment-sensitive tumors.

A study of ICU admissions for any type of lung carcinoma (80% of Non-Small Cell Bronchial Cancers) shows that of the 22,538 patients in stages III-IV, 16360 leave the hospital and 4,889 survive at 6 months. But only 11% of mechanically ventilated patients leave the hospital. [12] In our study, one of the four patients treated with chemotherapy responded well, a ratio of 25%.

Is there a place for targeted therapy:
Dewolf and Al, results was satistying in there study about administration of erlotinib via the nasogastric tube at a dose of 150 mg for intubated patient with advanced stage of pulmonary adenocarcinoma , [13]
Bosch-Barrera J et al. [14] published a case of an outstanding patient diagnosed with pulmonary neoplasia admitted to intensive care. The patient received erlotinib without even waiting for the result of molecular biology in view of the high probability of mutation. Results similar to those of Dewolf and Al. This is why , Admission decisions should be made on a case-by-case basis, somewhere between the two ends of the decision-making spectrum, based on the clinical evaluation and after discussions with the oncologist and patient. [15]

Conclusion:-

Clearly, moribund or chronically bedridden cancer patients and patients who refuse ICU admission should be managed in the wards. However, full ICU management should be offered to patients with newly diagnosed cancer and acute life-threatening cancer-related events such as bulky mediastinal disease, tumor lysis syndrome, pulmonary leukemic infiltration, or leukostasis at the onset of acute leukemia. Admission decisions should be made on a case-by-case basis, somewhere between the two ends of the decision-making spectrum, based on the clinical evaluation and after discussions with the oncologist and patient.

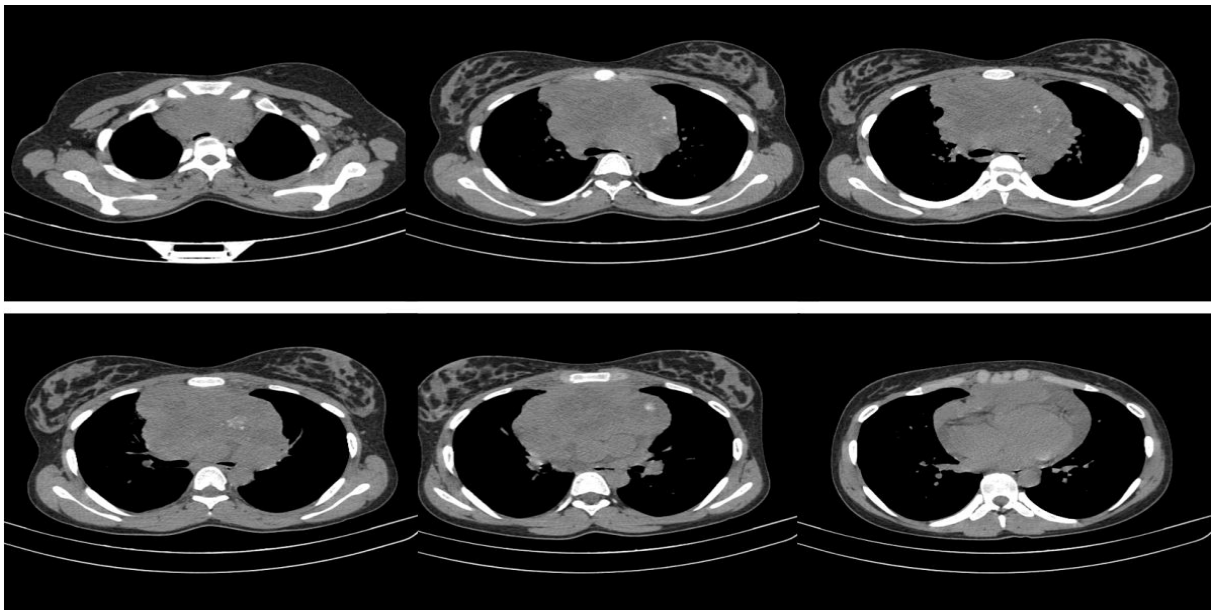

Fig 1:-Thoracic CT demonstrating the presence of cervical and mediastinal compressive adenopathies

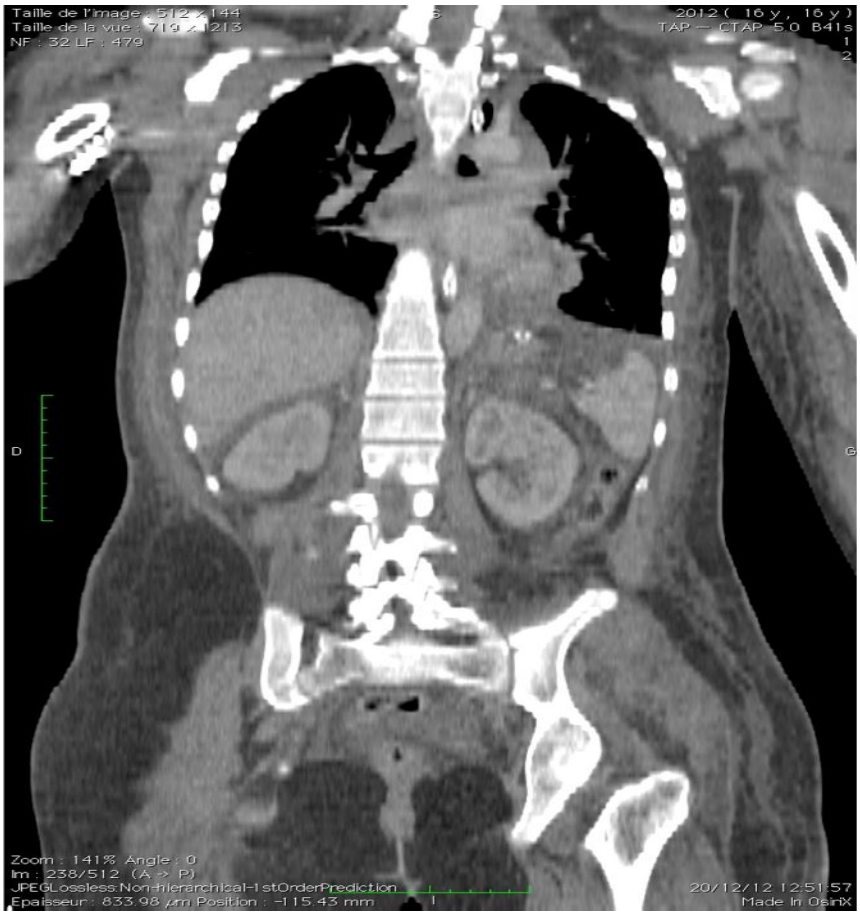

Fig 2:-Thoracic CT scan, performed after intubation and chemotherapy treatment

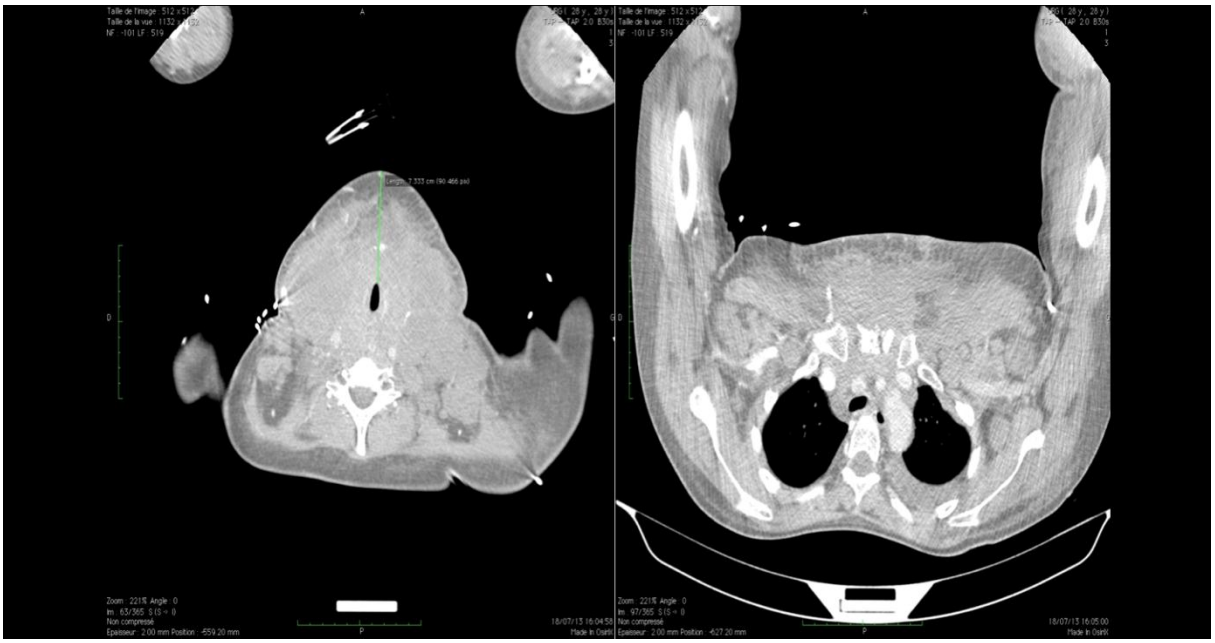

Fig 3:-CT scan of the 2nd patient showing thoracic adenopathies

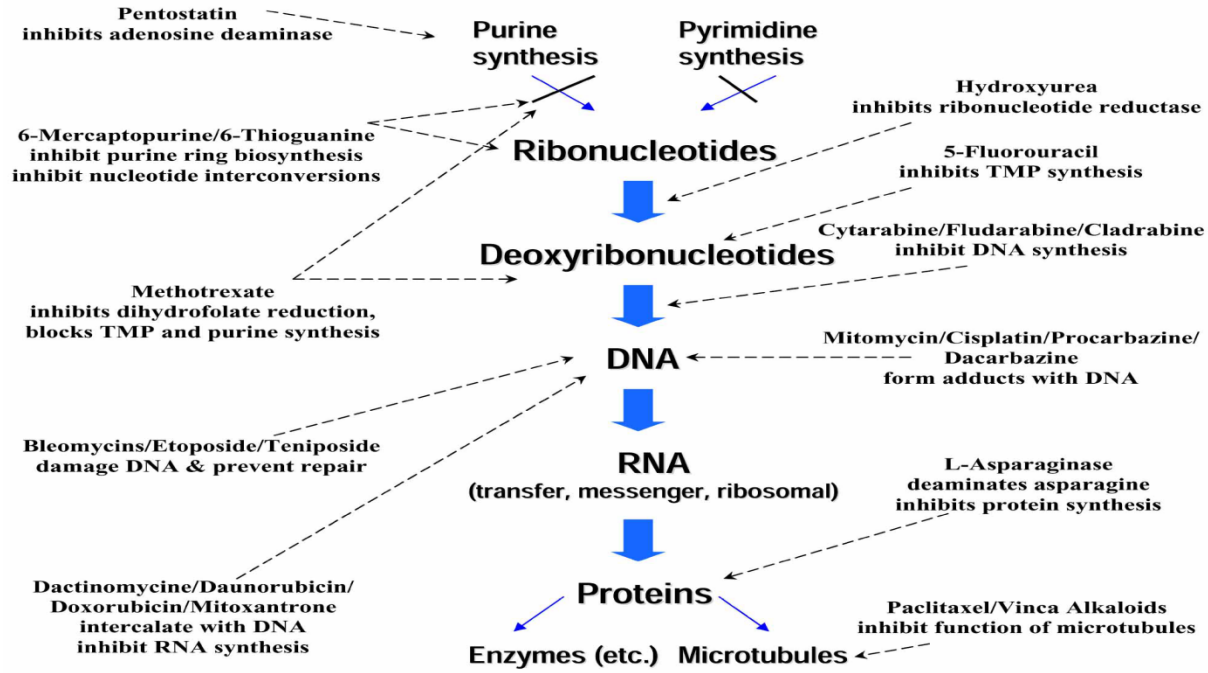

Fig 4:-Mechanism and site of action of various chemotherapy agents. TMP = Thymidine monophosphate. Adapted from Goodman and Gilman's The Pharmacological Basis of Therapeutics .

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