Pattern of malignancies on radiotherapy treatment versus chemotherapy treatment in oncology unit in Suez Canal University Hospital in Ismailia-Egypt

Azza S. Ali , Enas R. Mohammed , Hadeer M. Ismail , Naira S. Fahd , Nader A. Abd El-maogod , Noha M. Osman , Mahmoud A. Mohammed , Mahmoud M. Bakr , Mayada A. Hassan , Mohammed G. Mustafa , Walaa S. Galaa

Introduction

Choice of cancer treatment is influenced by several factors, including the specific characteristics of cancer; overall condition; and whether the goal of treatment is to cure cancer, keep cancer from spreading, or to relieve the symptoms caused by cancer. Depending on these factors, patient may receive one or more of the following: Surgery, Chemotherapy, Radiation therapy, Hormonal therapy, Targeted therapy, Biological therapy [(1)].

One or more treatment modalities may be used to provide patient with the most effective treatment. Increasingly, it is common to use several treatment modalities together (concurrently) or in sequence with the goal of preventing recurrence. This is referred to as multi-modality treatment of the cancer [(1)].

Chemotherapy is any treatment involving the use of drugs to kill cancer cells. It may consist of single drugs or combinations of drugs, and can be administered through a vein, injected into a body cavity, or delivered orally in the form of a pill. Chemotherapy is different from surgery or radiation therapy in that the cancer-fighting drugs circulate in the blood to parts of the body where the cancer may have spread and can kill or eliminate cancers cells at sites great distances from the original cancer. As a result, chemotherapy is considered a systemic treatment [(2)].

More than half of all people diagnosed with cancer receive chemotherapy. For millions of people who have cancers that respond well to chemotherapy, this approach helps treat their cancer effectively, enabling them to enjoy full, productive lives. Furthermore, many side effects once associated with chemotherapy are now easily prevented or controlled, allowing many people to work, travel, and participate in many of their other normal activities while receiving chemotherapy [(2)].

Radiation therapy, or radiotherapy, uses high-energy rays to damage or kill cancer cells by preventing them from growing and dividing. Similar to surgery, radiation therapy is a local treatment used to eliminate or eradicate visible tumors. Radiation therapy is not typically useful in eradicating cancer cells that have already spread to other parts of the body. Radiation therapy may be externally or internally delivered. External radiation delivers high-energy rays directly to the tumor site from a machine outside the body. Internal radiation, or brachytherapy, involves the implantation of a small amount of radioactive material in or near the cancer [(3)].

Radiation may be used to cure or control cancer, or to ease some of the symptoms caused by cancer. Sometimes radiation is used with other types of cancer treatment, such as chemotherapy and surgery, and sometimes it is used alone[(3)] .

The beams of radiation in radiotherapy are more powerful than ordinary X-rays. They aim to destroy the cancer cells with as little damage as possible to normal cells. Radiotherapy can be given on its own or with surgery, chemotherapy, hormone therapy or monoclonal antibody therapy. It can be given before surgery to shrink the tumor or after surgery to treat any residual disease. Radiotherapy can be given from outside the body (externally) or from inside (internally).Radiotherapy in general is safe. Depending on the type of radiotherapy, you may need to take special precautions after treatment. Radiotherapy may cause side effects that can last for a short or a longer period[(4)] .

Doctor may prescribe radiotherapy to destroy the tumour: this is called curative radiotherapy. Patient may also have radiotherapy to relieve symptoms (like pain): this is called palliative radiotherapy. Radiotherapy can be given before or after surgery. When it is given before surgery, it is called neo-adjuvant therapy. When given after, it can prevent any cancer cells left in patient's body from growing, and is called adjuvant therapy.There are different ways to give radiotherapy. It can be given from outside the body (externally) or from inside (internally). Sometimes both are used to treat cancer, for example, in the breast or prostate gland [(4)].

Radiation therapy is in itself painless. Many low-dose palliative treatments (for example, radiotherapy to bony metastases) cause minimal or no side effects, although short-term pain flare up can be experienced in the days following treatment due to oedema compressing nerves in the treated area. Treatment to higher doses causes varying side effects during treatment (acute side effects), in the months or years following treatment (long-term side effects), or after re-treatment (cumulative side effects). The nature, severity, and longevity of side effects depends on the organs that receive the radiation, the treatment itself (type of radiation, dose, fractionation, concurrent chemotherapy), and the patient. Most

side effects are predictable and expected. Side effects from radiation are usually limited to the area of the patient's body that is under treatment. One of the aims of modern radiotherapy is to reduce side effects to a minimum, and to help the patient to understand and to deal with those side effects which are unavoidable[(4)] .

Chemotherapy drugs can be divided into several groups based on factors such as how they work, their chemical structure, and their relationship to another drug. Because some drugs act in more than one way, they may belong to more than one group. Knowing how the drug works is important in predicting side effects. This helps oncologists decide which drugs are likely to work well together. If more than one drug will be used, this information also helps them plan exactly when each of the drugs should be given (in which order and how often) [(5).]

Cytotoxic medicines are powerful and often cause unwanted side-effects. Cytotoxic medicines work by killing cells which are dividing and so some normal cells are damaged too. However, side-effects vary from medicine to medicine. Even with the same medicine, different people can react differently. Some people develop more severe side-effects than others who take the same medicine. Sometimes, if side-effects are particularly severe, a change to a different medicine may be an option. Some of the most common and important side-effects are listed below. Other side-effects can occur. Your doctor or chemotherapy nurse will be able to discuss with you the likely side-effects you may experience with the particular medicines you will be receiving. Also, you can read a full list of possible side-effects of any medicine on the leaflet from the manufacturerAt the end of this section there is a checklist of symptoms which you should report straight away to a doctor if they occur whilst you are on a course of chemotherapy[(5)] .

The choice of treatment for cancer depends mostly on the type of primary cancer. A great deal of research has helped to pinpoint which types of cancer respond to particular treatments. Cancers vary widely in how they respond. For some cancers chemotherapy works better and for others radiotherapy does. For some cancers, your specialist will recommend that you have both. As well as the type of cancer you have, the choice of treatment may partly depend on whether the cancer is in just in one area of the body (localised) or whether it has spread (metastatic) [(6)].

Radiotherapy is a local treatment, like surgery. This means it treats a specific area – the area it is aimed at. Apart from from tiredness (fatigue), it only causes side effects in the part of the body being treated. With chemotherapy, the drugs travel through the bloodstream and treat the whole body. This is known as systemic treatment. So if a cancer has spread, chemotherapy might be a better choice of

treatment than radiotherapy. Chemotherapy is used after surgery for several types of cancer to try to reduce the risk of the cancer coming back. If your doctor thinks there is a chance that some cancer cells have broken away from your tumour before it was removed, they may suggest chemotherapy to try to kill off any cells that have escaped. This is called adjuvant treatment[(6)].

Some body tissues are more sensitive to radiation than others. There is a maximum dose that any part of the body can be exposed to. This is called a radiotherapy limit. So if you have had the maximum dose to a particular part of the body, then chemotherapy might be the only tretment open to you. As well as chemotherapy, radiotherapy and surgery, some cancers are treated with hormone therapy or biological therapies[(6)] .

We choose this project to know if chemotherapy is more effective then radio therapy and also we need to know if we can avoid complications of chemotherapy by using radiotherapy instead of it or they are separate modalities of treatment. We noticed that most of patients need both of chemotherapy and radiotherapy in their plan of treatment, so we need to know how the doctors take the decision of these plans of treatment and according to which patterns they can decide.

Aim of the project

To know how pattern of malignancies can affect doctors decision making in treatment modalities chemotherapy and radiotherapy in oncology unit in Suez Canal University

Objectives

-1ry objective

-To know when to use chemotherapy and radiotherapy in treatment of different types of malignancies.

- To know types of malignancies which need chemotherapy more than radiotherapy in oncology unit.

- To know pattern of patients who need chemotherapy and radiotherapy in the unit.

2ry objective:

-To determine which is widely used chemotherapy or radiotherapy.

-To know most important complications of chemotherapy and radio therapy.

-To know the cost needed in chemotherapy and radiotherapy for each patient.

Project question

What is the pattern of malignancies on radiotherapy treatment versus chemotherapy treatment in oncology unit in Suez Canal University?

Literature review

The global burden of cancer continues to increase largely because of the aging and growth of the world population alongside an increasing adoption of cancer-causing behaviors, particularly smoking, in economically developing countries. Based on the GLOBOCAN 2008 estimates, about 12.7 million cancer cases and 7.6 million cancer deaths are estimated to have occurred in 2008; of these, 56% of the cases and 64% of the deaths occurred in the economically developing world [(1)].

Breast cancer is the most frequently diagnosed cancer and the leading cause of cancer death among females, accounting for 23% of the total cancer cases and 14% of the cancer deaths. Lung cancer is the leading cancer site in males, comprising 17% of the total new cancer cases and 23% of the total cancer deaths. Breast cancer is now also the leading cause of cancer death among females in economically developing countries, a shift from the previous decade during which the most common cause of cancer death was cervical cancer. Further, the mortality burden for lung cancer among females in developing countries is as high as the burden for cervical cancer, with each accounting for 11% of the total female cancer deaths [(1)].

Breast cancers can be classified by different schemata. Each of these aspects influences treatment response and prognosis. Description of a breast cancer would optimally include all of these classification aspects, as well as other findings, such as signs found on physical exam. A full classification includes histo-pathological type, grade, stage (TNM), receptor status, and the presence or absence of genes as determined by DNA testing and histopathology [(2)].

Majority of breast cancers are derived from the epithelium lining the ducts or lobules, and are classified as mammary ductal carcinoma. Carcinoma in situ is proliferation of cancer cells within the epithelial tissue without invasion of the surrounding tissue. In contrast, invasive carcinoma invades the surrounding tissue. Peri-neural and/or lymphatic-vascular space invasion is usually considered as part of the histological description of a breast cancer, and when present may be associated with more aggressive disease. Normal cells in an organ like the breast become differentiated, meaning that they take on specific shapes and forms that reflect their function as part of that organ. Cancerous cells lose that differentiation. In cancer, the cells that would normally line up in an orderly way to make up the milk ducts become disorganized. Cell division becomes uncontrolled. Cell nuclei become less uniform [(2)].

Pathologists describe cells as well differentiated (low grade), moderately differentiated (intermediate grade), and poorly differentiated (high grade) as the cells progressively lose the features seen in normal breast cells. Poorly differentiated cancers have a worse prognosis. The main stages are: Stage 0 which is in situ disease or Paget's disease of the nipple. Stage 0 is a pre-cancerous or marker condition, either ductal carcinoma in situ (DCIS) or lobular carcinoma in situ (LCIS). Stages 1–3 are within the breast or regional lymph nodes. Stage 4 is a metastatic cancer. Metastatic breast cancer has a less favorable prognosis [(2)].

Cells have receptors on their surface and in their cytoplasm and nucleus. Chemical messengers such as hormones bind to receptors, and this causes changes in the cell. Breast cancer cells may or may not have many different types of receptors, the three most important in the present classification being: estrogen receptor (ER), progesterone receptor (PR), and HER2/neu. Cells with or without these receptors are called ER positive (ER+), ER negative (ER-), PR positive (PR+), PR negative (PR-), HER2 positive (HER2+), and HER2 negative (HER2-) [(2)].

Cells with none of these receptors are called basal-like or triple negative DNA-based classification. Understanding the specific details of a particular breast cancer may include looking at the cancer cell DNA by several different laboratory approaches. When specific DNA mutations or gene expression profiles are identified in the cancer cells this may guide the selection of treatments, either by targeting these changes, or by predicting from the DNA profile which non-targeted therapies are most effective [(2)].

Breast cancer patients with the same stage of disease can have markedly different treatment responses and overall outcome. The strongest predictors for metastases (for example, lymph node status and histological grade) fail to classify accurately breast tumours according to their clinical behavior. Chemotherapy or hormonal therapy reduces the risk of distant metastases by approximately one-third; however, 70–80% of patients receiving this treatment would have survived without it. None of the signatures of breast cancer gene expression reported to date allow for patient-tailored therapy strategies [(3)].

Here used DNA microarray analysis on primary breast tumours of 117 young patients, and applied supervised classification to identify a gene expression signature strongly predictive of a short interval to distant metastases ('poor prognosis' signature) in patients without tumor cells in local lymph nodes at diagnosis (lymph node negative). The poor prognosis signature consists of genes regulating cell cycle, invasion, metastasis and angiogenesis. This gene expression profile will outperform all currently used clinical parameters in predicting disease outcome. There findings provide a strategy to select patients who would benefit from adjuvant therapy [(3)].

Chemotherapy is more effective in Patients with breast cancer not expressing steroid hormone receptors. Research was done to identify factors predicting response to preoperative chemotherapy. Experimental Design: In a large volume laboratory using standard immune histochemical methods, they reviewed the pretreatment biopsies and histologic specimens at final surgery of 399 patients with large or locally advanced breast cancer (cT2-T4, N0–2, M0) who were treated with preoperative chemotherapy [(4)].

The incidence of pathological complete remission and the incidence of node-negative status at final surgery were assessed with respect to initial pathological and clinical findings. Menopausal status,

estrogen receptor status, progesterone receptor status [absent (0% of the cells positive) versus expressed], clinical tumor size, histologic grade, Ki-67, Her-2/neu expression, and type and route of chemotherapy were considered and result was : High rates of pathological complete remission were associated with absence of estrogen receptor and progesterone receptor expression [(4)].

Significant predictors of node-negative status at surgery were absence of estrogen receptor and progesterone receptor expression, clinical tumor size <5 cm , and use of infusional regimens. The chance of obtaining pathological complete remission or node-negative status for patients with endocrine nonresponsive tumors compared with those having some estrogen receptor or progesterone receptor expression was 4.22 (95% confidence interval, 2.20–8.09, 33.3% versus 7.5%) and 3.47 (95% confidence interval, 2.09–5.76, 42.9% versus 21.7%), respectively [(4)].

Despite the significantly higher incidence of pathological complete remission and node-negative status achieved by preoperative chemotherapy for patients with estrogen receptor and progesterone receptor absent disease, the disease-free survival was significantly worse . SO Response to preoperative chemotherapy is significantly higher for patients with endocrine nonresponsive tumors [(4)].

Two hundred fifty evaluable patients with breast cancer entered a protocol combining neoadjuvant and consolidation therapy by vinblastine (V), thiotepa (T), methotrexate (M), and 5-fluorouracil (F) (VTMF), with or without Adriamycin (A) (doxorubicin; Adria Laboratories, Columbus, OH), and radiation therapy as exclusive locoregional treatment. Tamoxifen was given to 195 patients (130 postmenopausal and 65 premenopausal) and was omitted in 55 patients (31 postmenopausal and 24 premenopausal) [(5)].

There were 19 Stage I, 86 Stage IIA, 51 Stage IIB, 36 Stage IIIA, and 58 Stage IIIB patients. Primary chemotherapy induced tumor volume regression of more than 75% in 41% of the patients and complete clinical regression in 30% of the patients. The 5-year disease-free survival (DFS) rates were 100% for Stage I, 82% for Stage IIA, 61% for Stage IIB, 46% for Stage IIIA, and 52% for Stage IIIB patients. Among the 72 primary relapses there were 39 distant metastases, 6 loco-regional and distant metastases, and 27 isolated loco-regional metastases [(5)].

The actuarial rate of loco-regional recurrence was 13% for T2, 18% for T3, and 19% for T4. At 5 years the rate of breast preservation was 94%. Cosmetic results were excellent or good for most patients.

The 5-year overall survival (OS) rates were 95% for Stage I, 94% for Stage IIA, 80% for Stage IIB, 60% for Stage IIIA, and 58% for Stage IIIB. Most patients with breast cancer should be given the option of breast-preserving treatment [(5)].

Breast cancer subtypes: response to radiotherapy and potential radio sensitization. Radiotherapy (RT) is of critical importance in the loco regional management of early breast cancer. Over 50% of patients receive RT at some time during the treatment of their disease, equating to over 500 000 patients worldwide receiving RT each year. Unfortunately, not all patients derive therapeutic benefit and some breast cancers are resistant to treatment, as evidenced by distant metastatic spread and local recurrence. Prediction of individual responses to RT may allow a stratified approach to this treatment permitting those patients with radio-resistant tumours to receive higher doses of RT (total and/or tumor cavity boost doses) and/or radio-sensitizing agents to optimize treatment [(6)].

Also, for those patients unlikely to respond at all, it would prevent harmful side effects occurring for no therapeutic gain. More selective targeting would better direct National Health Service resources, ease the burden on heavily used treatment RT machines and reduce the economic cost of cancer treatment. Unfortunately, there are no robust and validated biomarkers for predicting RT outcome [(6)].

The British Columbia randomized radiation trial was designed to determine the survival impact of loco-regional radiation therapy in premenopausal patients with lymph node–positive breast cancer treated by modified radical mastectomy and adjuvant chemotherapy. Three hundred eighteen patients were assigned to receive no further therapy or radiation therapy (37.5 Gy in 16 fractions) [(7)].

Previous analysis at the 15-year follow-up showed that radiation therapy was associated with a statistically significant improvement in breast cancer survival but that improvement in overall survival was of only borderline statistical significance and results were : At the 20 year follow up (median follow up for live patients: 249 months) chemotherapy and radiation therapy, compared with chemotherapy alone, were associated with a statistically significant improvement . So : For patients with high-risk breast cancer treated with modified radical mastectomy, treatment with radiation therapy and adjuvant chemotherapy leads to better survival outcomes than chemotherapy alone, and it is well tolerated, with acceptable long-term toxicity [(7)].

In colorectal cancer, you have a high risk of colon cancer if you are older than 60 ,Are African American of eastern European descent, eat a lot of red or processed meats, have colorectal polyps, have inflammatory bowel disease (Crohn's disease or ulcerative colitis) ,Have a family history of colon cancer ,Have a personal history of breast cancer. Certain inherited diseases also increase the risk of developing colon cancer [(8)].

Two of the most common are familial adenomatous polyposis (FAP) , hereditary non polyposis colorectal cancer (HNPCC), Stages of colon cancer are Stage 0: Very early cancer on the innermost layer of the intestine ,Stage I: Cancer is in the inner layers of the colon ,Stage II: Cancer has spread through the muscle wall of the colon, Stage III: Cancer has spread to the lymph nodes ,Stage IV: Cancer has spread to other organs outside the colon [(8)].

Treatment depends on many things, including stage of the cancer. Treatments may include surgery (most often a colectomy) to remove cancer cells. Chemotherapy to kill cancer cells, Radiation therapy to destroy cancerous tissue .Despite the increasing use of palliative chemotherapy for advanced colorectal cancer, there remains uncertainty as to the true effectiveness of this intervention [(8)].

This review was therefore undertaken to assess the available evidence for the benefit of palliative chemotherapy in this disease : 13 randomised controlled trials representing a total of 1365 randomised patients met the inclusion criteria. Meta-analysis of a subset of trials that provided individual patient data demonstrated that palliative chemotherapy was associated with a 35% (95% CI 24% to 44%) reduction in the risk of death. This translates into an absolute improvement in survival of 16% at both 6 months and 12 months and an improvement in median survival of 3.7 months. The overall quality of evidence relating to treatment toxicity, symptom control and quality of life was poor [(8)].

Preoperative radiotherapy (RT) decreases local recurrence rate and improves survival in stage II and III rectal cancer patients. The combination of chemotherapy with RT has a sound radiobiological rationale, and phase II trials of combined chemo-radiation (CRT) have shown promising activity in rectal cancer. Five trials were identified and included in the meta-analysis. From one of the included trials only preliminary data are reported [(9)].

The addition of chemotherapy to preoperative RT significantly increased grade III and IV acute toxicity and marginally affected postoperative overall morbidity while no differences were observed in

postoperative mortality or anastomotic leak rate. Compared to preoperative RT alone, preoperative CRT significantly increased the rate of complete pathological response although this did not translate into a higher sphincter preservation rate. The incidence of local recurrence at five years was significantly lower in the CRT group compared to RT alone [(9)].

Gastric cancer currently ranks second in global cancer mortality. Most patients are either diagnosed at an advanced stage, or develop a relapse after surgery with curative intent. Apart from supportive care and palliative radiation to localized (e.g. bone) metastasis, systemic chemotherapy is the only treatment option available in this situation. Borrmann classificationis used by pathologists to describe the appearance and growth patterns of advanced stomach cancer, as it appears to the unaided eye (macroscopic appearance).The Borrmann classification defines 5 different growth patterns type I – polypoid tumors grow outward from the stomach wall and stick out into the stomach. The tumors have no ulcers or areas of erosion. Type II – fungating tumors grow outward from the stomach wall in irregular patterns [(10)].

The tumors may have ulcers or areas of erosion. Type III – ulcerated Tumors have ulcers with irregular, hard, stiff margins of raised tissue. There are areas of dead or dying tissue (necrosis) within the ulcer. Type IV – infiltrated Tumors spread along the mucosa or submucosa of the stomach wall, producing flat tumors. These tumors may eventually cause the stomach wall to become hard and rigid. Type V – unclassifiable Tumors do not fit into any of the other 4 categories [(10)].

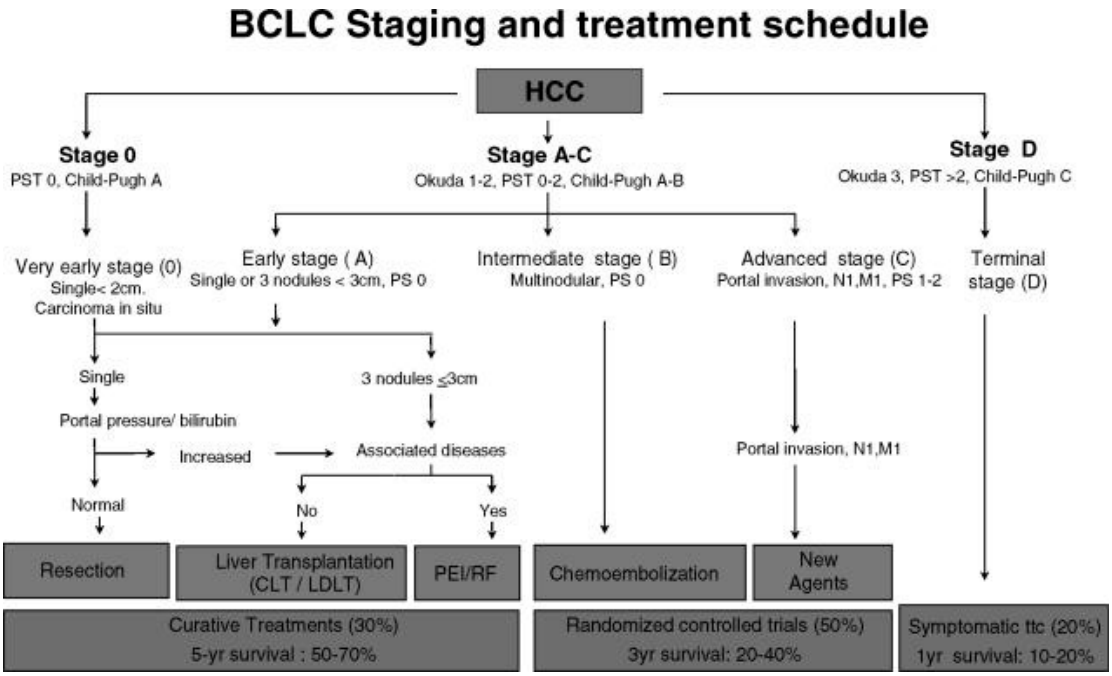
Treatment option for stomach cancer is surgery. Surgery may be used to completely remove the tumor. It may be used to remove part of a stomach tumor before starting chemotherapy or radiation therapy (neoadjuvant_therapy).It may be used after other therapies, such as chemotherapy or radiation therapy (adjuvant therapy).Reconstruction of the gastrointestinal tract after the stomach has been removed is an important part of surgery. Surgery may also be used to ease symptoms of advanced stomach cancer [(10)].

Chemotherapy significantly improves survival in comparison to best supportive care. Thirty five trials, with a total of 5726 patients, have been included in the meta-analysis of overall survival. The comparison of chemotherapy versus best supportive care consistently demonstrated a significant benefit in overall survival in favour of the group receiving chemotherapy. The comparison of combination

versus single-agent chemotherapy provides evidence for a survival benefit in favour of combination chemotherapy. The price of this benefit is increased toxicity as a result of combination chemotherapy [(10)].

Radiation therapy_Palliative RT controls symptoms for most of the remaining life in the majority of gastric cancer patients. The role of a higher dose of RT (BED >or=41 Gy), especially in patients with T4 tumors, remains to be established. In order to accurately define the role for radiotherapy in palliation of these symptoms, prospective randomized studies need to be conducted. The rates of control for bleeding, dysphagia/obstruction, and pain were 70% (14/20), 81% (13/16), and 86% (6/7), respectively. These symptoms were controlled without additional interventions for a median of 70%, 81%, and 49% of the patient's remaining life, respectively. Patients receiving CRT had a trend towards better median overall survival than those receiving RT alone [(11)].

Hepatocellular carcinoma (HCC) is a major health problem worldwide. It is the fifth most common neoplasm in the world, with more than half million new cases yearly. The incidence of HCC rose in the last decade. In the USA, the incidence of HCC is expected to increase over the next two decades, equaling that currently experienced in Japan. HCC is now the leading cause of death among cirrhotic patients [(12)].



Hepatocellular carcinoma is a disease of great concern. Surgery is the treatment of choice, but there is still a high recurrence rate after resection. There is no clear evidence for efficacy of any of the adjuvant and neo-adjuvant protocols reviewed, but there is some evidence to suggest that adjuvant therapy may be beneficial offering prolonged disease-free survival. In order to detect a realistic treatment advantage, larger trials with lower risk of systematic error will have to be conducted [(13)].

The effects of RFA versus no intervention, chemotherapeutic treatment, or liver transplantation are unknown. We found moderate-quality evidence that hepatic resection is superior to RFA regarding survival. However, RFA might be associated with fewer complications and a shorter hospital stay than hepatic resection. We found moderate-quality evidence showing that RFA seems superior to percutaneous ethanol injection regarding survival. There were too sparse data to recommend or refute ablation achieved by techniques other than RFA. More randomized clinical trials with low risk of bias and low risks of random errors assessing the effect of RFA are needed[(14)].

Oesophygeal cancer staging

Stage IA	T1	N0	M0
Stage IB	T2	N0	M0
Stage IIA	T3	N0	M0
Stage IIB	T1,T2	N1	M0
Stage IIIA	T4a	N0	M0
	T3	N1	M0
	T1,T2	N2	M0
Stage IIIB	T3	N2	M0
Stage IIIC	T4a	N1,N2	M0

	T4b Any T	Any N N3	M0 M0
Stage IV	Any T	Any N	M1

In a recent population-based study of 1618 patients with esophageal cancer of grades Tis (high-grade dysplasia), T1a (invades lamina propria or muscularis mucosae), or T1b (invades submucosa), overall survival times and esophageal-cancer-specific survival times were similar in patients treated with endoscopic therapy and those treated with surgery after adjustment for patient and tumor factors [(15)].

Esophageal cancer is supposed to be more sensitive to chemotherapy compared to other gastrointestinal cancers. Since cisplatin (CDDP) was developed, it has become a key drug for combined chemotherapy. At present, the combination of CDDP and 5-fluorouracil (5-FU) is the standard regimen for the treatment of esophageal carcinoma. Nedaplatin (CDGP) and paclitaxel (TXL) have shown favorable results either as a single agent or in combination with CDDP. A comparison of drug efficacy between these new regimens and CDDP/5-FU in more cases has yet to be carried out. However, since esophageal cancer can hardly be cured by definitive chemotherapy alone, chemotherapy plays an important role in the multimodality therapy for esophageal cancer [(16)].

The results of definitive chemo-radiotherapy for advanced esophageal cancer have recently improved. The efficacy of preoperative (neoadjuvant) chemo-radiotherapy in terms of survival benefit still remains controversial according to a meta-analysis of large-scale, randomized controlled trials (RCTs) when compared with surgery alone. A RCT completed by the Japan Clinical Oncology Group (JCOG) demonstrated the prognostic benefit of postoperative adjuvant chemotherapy for disease-free survival in comparison to surgery alone. Another RCT by JCOG has been conducted to clarify whether preoperative or postoperative chemotherapy may have a prognostic benefit in patients who undergo an esophagectomy [(16)].

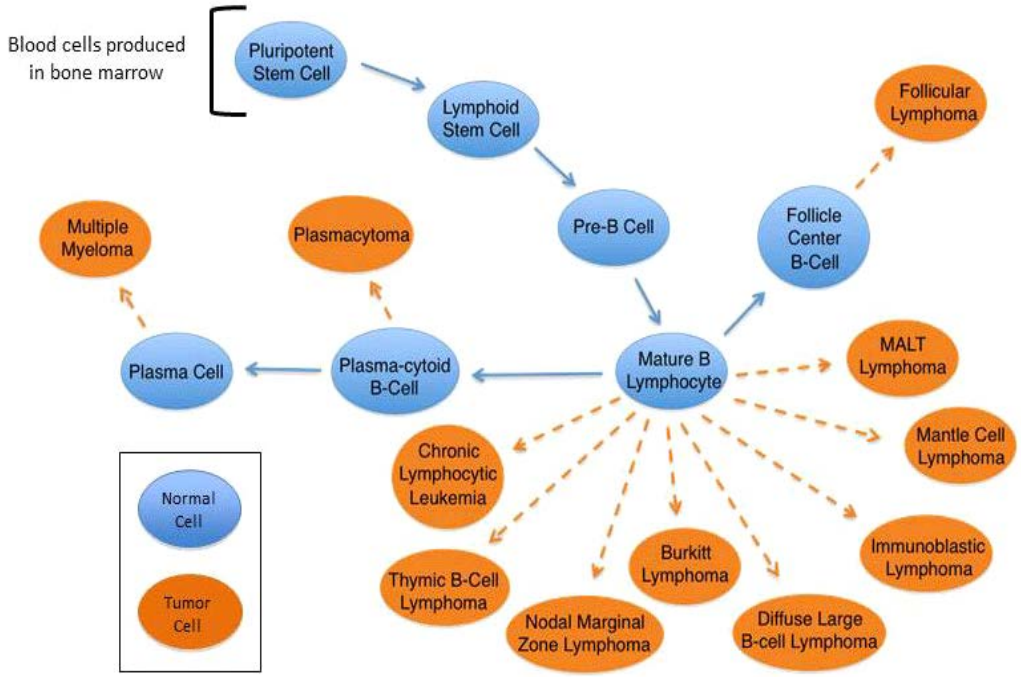
Sixty-two assessable patients were randomized to receive RT alone, and 61 to the combined arm. Patients characteristics were as follows: squamous cell cancer, 90% versus 85%; weight loss greater than 10 lb, 61% versus 69%; and tumor size, > or = 5 cm, 82% versus 80% on the RT and CT-RT arms, respectively. Systemic side effects, which consisted of nausea, vomiting, and renal and

myelosuppression, occurred more frequently on the combined arm, while local side effects were similar in both groups. With a minimum follow-up time of 5 years for all patients, the median survival duration was 14.1 months and the 5-year survival rate was 27% in the combined treatment group, while the median survival duration was 9.3 months with no patients alive at 5 years in the RT-alone group [(17)].

Additional patients (69) were treated with the same combined therapy and were analyzed. The results of the last group confirmed all of the results obtained with combined CT-RT in the randomized trial, with a median survival duration of 17.2 months and 3-year survival rate of 30%.We conclude that cisplatin and 5FU infusion given during and post-RT of 50 Gy is statistically superior to standard 64-Gy RT alone in patients with locally advanced esophageal cancer [(17)].

The existing randomized evidence has failed to conclusively demonstrate the benefit or otherwise of preoperative radiotherapy in treating patients with potentially resectable esophageal carcinoma. This meta-analysis aimed to assess whether there is benefit from adding radiotherapy prior to surgery. With a median follow-up of 9 years, the hazard ratio (HR) of 0.89 (95% CI 0.78–1.01) suggests an overall reduction in the risk of death of 11% and an absolute survival benefit of 3% at 2 years and 4% at 5 years. This result is not conventionally statistically significant [(18)].

No clear differences in the size of the effect by sex, age, or tumor location were apparent. Based on existing trials, there was no clear evidence that preoperative radiotherapy improves the survival of patients with potentially resectable esophageal cancer. These results indicate that if such preoperative radiotherapy regimens do improve survival, then the effect is likely to be modest with an absolute improvement in survival of around 3 to 4%. Trials or a meta-analysis of around 2000 patients would be needed to reliably detect such an improvement (15→20%) [(18)].



From 2005 to 2009, incidence rates were stable for both Hodgkin and non-Hodgkin lymphoma. The table below shows the estimates for the number of new cases and deaths that will occur in 2013.

	Estimated New Cases	Estimated Deaths
Lymphoma	79,030	20,200
Hodgkin's Lymphoma	9,290	1,180
Non-Hodgkin's Lymphoma	69,740	19,020

Death rates for Hodgkin lymphoma have been decreasing for the past four decades; from 2005 to 2009, rates decreased by 2.7% per year. Death rates for non-Hodgkin's lymphoma began decreasing in the late 1990s; from 2005 to 2009, rates decreased 3.0% per year. Declines in lymphoma death rates reflect improvements in treatment over time [19].

They conducted a retrospective study of 135 patients of stage IE/IIE extra nodal natural killer/T cell lymphoma, nasal type (ENKTL) treated with CHOP as induction chemotherapy to find some valuable prognostic factors and analyze the usefulness of International Prognostic Index (IPI) and Korean Prognostic Index (KPI) in predicting prognosis. Most of the patients were in the low-risk group (IPI score 0–1). Complete remission (CR) after induction chemotherapy was achieved in 31.8 % of the patients, which increased to 69.6 % after radiotherapy. The 2-, 5-, and 10-year overall survival (OS) rates were 60, 48, and 43 %, respectively [(20)].

Patients with better performance status (ECOG 0-1), normal serum LDH level, without local invasiveness, low KPI scores, and IPI score of 0 had significantly better overall survival in univariate analysis. Using multivariate analysis, we identified serum LDH level, ECOG PS score and local invasiveness to be independent prognostic factors. In conclusion, ENKTL is an aggressive lymphoma that shows heterogeneity. The IPI and KPI score systems should be improved further to classify patients into different groups, and should be validated in larger prospective trials. Due to the multi-drug resistance mechanism of ENKTL, CHOP is no longer the state of art and novel drugs should be incorporated into future treatments [(20)].

Outcomes after combined-modality therapy in patients with Stage I/II head-and-neck (HN) diffuse large B cell lymphoma (Eighty-six eligible patients received sequential chemotherapy and involved-lesion radiation therapy from 1995 to 2006. After a median of four cycles of CHOP (cyclophosphamide, doxorubicin, vincristine, and prednisone) or rituximab-plus-CHOP chemotherapy, a median of 41.4 Gy was delivered to the known initial gross lesion with adequate margin (2 to 3 cm) [(21)].

After a median follow-up of 57 months, eight treatment failures were observed: distant metastasis in 8 patients; and locoregional failure in 4 patients. Among the 4 patients with locoregional failure, 3 presented with in-field failures, and 1 both in-field and out-of-field failure (contralateral neck). Rates of overall survival (OS) and freedom from progression (FFP) at 10 years were 74.1% and 88.9%, respectively. There was no severe side effect except 1 patient with Grade 3 mucositis during and after completion of radiation therapy [(21)].

Multivariate analyses showed that absence of B symptom and normal lactate dehydrogenase were related to favorable OS, age >60 years was related to favorable FFP, and international prognostic index of 0 or 1 was related to favorable OS and FFP .This study demonstrated that patients with Stage

I/II HN DLBL did not need whole-neck irradiation. Involved-lesion radiation therapy might reduce radiation toxicity with favorable treatment results [21].

Other study show the long-term clinical outcome of elderly patients with localized aggressive lymphoma after a long term Follow-up Study of Prospective 80%-dose CHOP Followed by Involved-field radiotherapy with 80%-dose CHOP (cyclophosphamide 600 mg/m^2, doxorubicin 40 mg/m^2, vincristine 1.1 mg/m^2 and prednisolone 80 mg/day for 5 days) was repeated every 3 weeks. After three cycles of chemotherapy, involved-field radiotherapy was performed with 30–50 Gy in 15–28 fractions. A total of 24 patients (median age, 75 years; range, 70–84 years) were enrolled. Nineteen patients (79%) had non-bulky tumors <6 cm. The median follow-up period was 7.3 years [22].

The 7-year overall and progression-free survival rates were 78.9% (95% confidence interval, 62.3–95.5) and 65.3% (95% confidence interval, 45.3–85.3), respectively. Six patients developed systemic relapse, two of them after 6 years. The median survival time after relapse was only 5 months (range, 2 weeks–5.2 years). Five patients developed second malignancies, and three other patients died from other causes without lymphoma progression. None of the patients developed local relapse within the radiation field and/or regional relapse in adjacent lymph node areas [22].

TNM and stage classification of bronchogenic carcinoma shows that, primary tumor (T): TX: tumor proven by the presence of malignant cells in Broncho pulmonary secretions but not visualized roentgen graphically or bronchoscopically, or any tumor that cannot be assessed as in a retreatment staging. TO: no evidence of primary tumor. TI S: Carcinoma in situ. TI: a tumor that is 3.0 cm or less in greatest diameter, surrounded by lung or visceral pleura and without evidence of invasion proximal to a lobar bronchus at bronchoscopy [23].

T2: a tumor more than 3.0 cm in greatest diameter, or a tumor of any size that either invades the visceral pleura or has associated atelectasis or obstructive pneumonitis extending to the hilar region. At bronchoscopy, the proximal extent of demonstrable tumor must be within a lobar bronchus or a t least 2.0 cm distal to the carina. Any associated atelectasis or (obstructive pneumonitis must involve less than an entire lung, and there must be no pleural invasion.T3 : tumor of any size with direct extension into an adjacent structure such as the parietal pleura or chest wall, the diaphragm, or the mediastinum and its contents; or a tumor demonstrable bronchoscopically to involve a main bronchus less than 2.0 cm distal to the carina; or any tumor associated with atelectasis or obstructive pneumonitis of an entire lung or pleural effusion [23].

Nodal involvement (N): N0: no demonstrable metastasis to regional lymph nodes. N1: metastasis to lymph nodes in the per bronchial or the ipsilateral hilar region, or both, including direct extension.N2: metastasis to lymph nodes in the mediastinum.-Distant metastasis (M), MX: Not assessed.M0: No (known) distant metastasis. M1: Distant metastasis [23].

Dresent S Decifv-Stage Grouping: 1-Occult carcinoma: TX NO MO An occult carcinoma with broncho-pulmonary secretions containing malignant cells but without other evidence of the primary tumor or evidence of metastasis to the regional lymph nodes or distant metastasis. Stage Ia: TIS NO MO Carcinoma in situ T1 NO MO T1 N1 MO T2 NO MO c-Stage II : T2 Nl MOd-StageIII : T3 with any N or M N2 with any T or M M1 with any T or N [23].

Histologic classification according to WHO recommendations : 1-Squamous cell carcinoma (epidermoid carcinoma)Variant: -Spindle cell. -(squamous carcinoma) ,2-Small cell carcinoma: a) Oat cell carcinoma b) Intermediate cell type c) Combined oat cell carcinoma ,3-Adenocarcinoma: a) Acinar adenocarcinoma b) Papillary adenocarcinoma c) Bronchiolo-alveolar carcinoma d) Solid carcinoma with mucus formation, 4-Large cell carcinoma variants: a) Giant cell carcinoma b) Clear cell carcinoma ,5-Adenosquamous carcinoma ,6-Carcinoid ,7-Bronchial Gland Carcinomas a) Adenoid cystic b) Mucoepidermoid carcinoma c) Others ,8-Others [23].

Stage IV non-small cell lung cancer (NSCLC) denotes the presence of metastatic disease and is largely incurable using present-day therapies. Chemotherapy remains a therapeutic option in this patient population, and there are many pertinent issues surrounding its use in patients with stage IV NSCLC [24].

In early-stage NSCLC, surgical resection remains the standard of care in fit patients. Ongoing trials in this setting are addressing the role of both adjuvant and neoadjuvant chemotherapy. In fit patients with unresectable, locally advanced, stage III NSCLC, chemotherapy in combination with thoracic radiation therapy (TRT) is the standard of care. C-Stage IV NSCLC denotes the presence of metastatic disease. The more common sites of metastatic disease include the liver, bones, adrenal, brain, and contralateral lung. The 5-year survival rate of this group of patients is 1%, and therefore these patients are generally considered to be incurable [24].

The important issues to address include which patients are appropriate for chemotherapy, the survival and palliative impact of chemotherapy, the optimal chemotherapeutic approach, and its toxicity and outcomes expectations. Recommendations for use of chemotherapy in this group of patients , when

selecting patients for systemic chemotherapy, PS at the time of diagnosis should be used because it is a consistent prognostic factor for survival. Patients with a PS (performance state) of ECOG(eastern c0-0perative oncology group) level 0 or 1 should be offered chemotherapy [24].

Grade of recommendation, patients with a good PS (ie, ECOG level 0 or 1) should be considered for a platinum-based chemotherapy regimen based on the survival advantage provided over BSC(best supportive care) . -; grade of recommendation, although the new agents demonstrate improved survival compared to BSC in elderly as well as nonelderly patients with advanced NSCLC, the data are not yet sufficient to compare the new single agents to platinum-based combinations [24].

Grade of recommendation, Combination chemotherapy regimens incorporating the new single agents with a platinum-based agent should be considered the standard of care. Grade of recommendation, no one regimen has been demonstrated to be superior in the first-line therapy for patients with advanced NSCLC. A cisplatin-based or carboplatin-based combination regimen that includes one of the new agents remains the standard of care for first-line therapy in patients with stage IV NSCLC. The duration of first-line therapy in patients with stage IV NSCLC should be brief, consisting of three to four cycles or fewer if there are signs of progressive disease [24].

Patients with a good PS who are experiencing disease progression after receiving platinum-based chemotherapy should be offered second-line chemotherapy. grade of recommendation, data from case series and randomized trials show that chemotherapy can have a palliative effect on disease-related symptoms and can improve QOL(quality of life) compared to BSC in stage IV NSCLC patients who are deemed suitable for treatment. Patient preferences need to be considered and respected with regard to the decision to treat with chemotherapy [24].

Most patients would not choose chemotherapy for a likely survival time of 3 months or a < 10% improvement in the 1-year survival rate unless there was an improvement in QOL. No patient variables have been identified to determine an individual patient's minimum threshold to accept chemotherapy, and therefore the decision to treat with chemotherapy needs to be discussed with each patient individually [24].

Patients with stage IV NSCLC should be referred to a physician with specialized training in oncology. If chemotherapy is considered to be appropriate, adequate resources to administer

chemotherapy safely must be available. -grade of recommendation, Combination platinum-based chemotherapy can be administered safely with acceptable and manageable toxicity profiles in patients with good PS who have stage IV NSCLC. grade of recommendation, A [24].

Recommendations for use of radiotherapy in treatment of advanced NSCLC, radiation for Locally Advanced Unresectable NSCLC: Radiation therapy should be included as part of treatment for selected patients with unresectable locally advanced NSCLC. Patient Selection: Candidates for definitive thoracic radiotherapy with curative intent should have performance status 0, 1, or possibly 2, adequate pulmonary function, and disease confined to the thorax. Patients with malignant pleural effusions and those with distant metastatic disease are not appropriate candidates for definitive thoracic radiotherapy [25].

Dose and Fractionation: Definitive-dose thoracic radiotherapy should be no less than the biologic equivalent of 60 Gy, in 1.8-Gy to 2.0-Gy fractions. Local- and Distant- Site Palliative Effects of External-Beam Radiation: Local symptoms from primary or metastatic NSCLC can be relieved by a variety of doses and fractionations of external-beam radiotherapy. In appropriately selected patients, hypofractionated palliative radiotherapy (of one to five fractions instead of 10) may provide symptomatic relief with acceptable toxicity in a more time-efficient and less costly manner [25].

Unlike other squamous cell cancers of the head and neck, nasopharyngeal cancer does not appear to be linked to excess use of tobacco or moderate alcohol intake (up to 15 drinks a week). Factors thought to predispose to this tumor include the following: Chinese (or Asian) ancestry. Epstein-Barr virus (EBV) exposure, unknown factors that result in very rare familial clusters, heavy alcohol intake. Cellular classification of nasopharyngeal cancer although shows a wide variety of malignant tumors may arise in the nasopharynx, only squamous cell carcinoma is considered in this discussion because management of the other types varies substantially with histology [26].

Subdivisions of squamous cell carcinoma in this site include the following: World Health Organization (WHO) histopathological grading system describes three types of nasopharyngeal cancer: Keratinizing squamous cell carcinoma. Non-keratinizing squamous cell carcinoma. Undifferentiated carcinoma (most common subtype). Previous subdivisions of nasopharyngeal carcinoma included lympho-epithelioma, which is now classified as WHO grade III characterized by lymphoid infiltrate.

WHO grade I-type cancer accounts for 20% of cases in United States and is associated with alcohol and tobacco use; WHO grade II and III represent the endemic form seen in Southern China. The presence of keratin has been associated with reduced local control and survival [(26)].

A study was published to describe the treatment outcomes and treatment-related complications of nasopharyngeal carcinoma (NPC) patients treated with radiotherapy alone. Results show that, the 5-year overall and disease-free survival rates of the patients upon which study was done were 59% and 52%, respectively. Advanced para-pharyngeal space (PPS) invasion showed stronger prognostic value than PPS invasion. Multiple neck lymph node (LN) involvement was demonstrated to be one of the most powerful independent prognostic factors among all LN-related parameters [(27)].

A study was published to determine the additional value of neoadjuvant, concurrent, and/or adjuvant chemotherapy to radiation in the treatment of locally advanced nasopharyngeal carcinoma (NPC) with regard to the overall survival (OS) and the incidence of local-regional recurrences (LRR) and distant metastases (DM).Results : Ten randomized clinical studies were identified, including 2,450 patients. . Three categories of trials were defined according to the sequence of chemotherapy, including neoadjuvant chemotherapy, at least concomitant chemo-radiotherapy, and adjuvant chemotherapy. Conclusion shows that the results of this study indicate that concomitant chemotherapy in addition to radiation is probably the most effective way to improve OS in NPC [(28)].

In a study of Trial of Fludarabine plus Cyclophosphamide Compared with Fludarabine for Patients with Previously Untreated Chronic Lymphocytic Leukemia. A total of 278 patients were randomly assigned in this intergroup study. Treatment with Fludarabine and cyclophosphamide was associated with a significantly higher complete response (CR) rate \ and a higher overall response (OR) rate than treatment with Fludarabine as a single agent [(29)].

Progression-free survival (PFS) was also superior in patients treated with fludarabine and cyclophosphamide than those treated with Fludarabine. Fludarabine and cyclophosphamide caused additional hematologic toxicity, including more severe thrombocytopenia, but it did not increase the number of severe infections . Conclusion shows that Fludarabine and cyclophosphamide produced an increase in OR and CR, and it improved PFS in patients with previously untreated CLL compared with Fludarabine alone and was not associated with an increase in infectious toxicity [(29)].

In a study of comparison of total body irradiation vs chlorambucil and prednisone for remission induction of active chronic lymphocytic leukemia shows that total body irradiation response and toxicity: Twenty-six evaluable patients were entered into two fractionated total body irradiation (TBI) programs; 11 patients received a course of 150 rad TBI (× 3 if tolerated) and 15 patients received a lower dose course of 50 rad (× 3 if tolerated). Complete remissions (CR) were not produced by either course; however, the higher dose course (Plan I) yielded a partial response (PR) rate of 73 %, while the lower dose course yielded a PR of 47 % [30].

Although fraction size seemed trivial in both TBI plans, an unexpected high degree of hematologic toxicity was encountered, and was parallel to the response rates: in Plan I 173 % of patients experienced severe to life-threatening depression of platelets or granulocytes, whereas in Plan II this rate was 47 %. This was of short duration with rapid return of blood counts to normal levels. One death can be attributed to TBI. The chemotherapy arm of the study demonstrated superiority in terms of complete responses [30].

Twenty-three percent of patients treated by cholrambucil and prednisone attained CR, in contrast to 0% of TBI patients. PR for chemotherapy was similar to that obtained with TBI. Chemotherapy also proved superior in terms of overall response rate, number of patients in remission, and in the median duration of response, but not in the median duration of survival. Fractional TBI techniques for active chronic lymphocytic leukemia (CLL) should be interrupted when the platelet count dips below 100,000 and the granulocyte count is lower than 2,000. Future studies should combine TBI radiation therapy and chemotherapy [30].

Prostate cancer is one of the most common types of cancer in men. Prostate cancer usually grows slowly and initially remains confined to the prostate gland, where it may not cause serious harm. While some types of prostate cancer grow slowly and may need minimal or no treatment, other types are aggressive and can spread quickly. Prostate cancer that is detected early when it's still confined to the prostate gland has a better chance of successful treatment [31].

Clinically localized prostate cancer generally causes no symptoms. Slowing of the urinary stream, arising at night to void, and increased urinary frequency are common symptoms associated with aging but often are unrelated to the presence of prostate cancer. It is for this reason that early detection tests have been developed in order to identify prostate cancer while it remains confined to the prostate. The two most commonly used tests are a serum PSA level and a digital rectal examination (DRE) [32].

Tumor aggressiveness can be determined by the pathologist's examination of the microscopic pattern of the cancer cells. The most commonly used tumor grading system is the Gleason grading. This system assigns a grade for each prostate cancer from 1 (least aggressive) to 5 (most aggressive) based on the degree of architectural differentiation of the tumor ,Gleason score is obtained by combining the most predominant pattern grade with the highest grade [(33)].

The Gleason score is then displayed as, for example, 3+4 where 3 would be the most common pattern of tumor and 4 the second most common pattern (or highest pattern) of tumor seen in the core. Given that the individual Gleason value can range from 1 to 5, the added values (Gleason scores or "sums") can range from 1+1 to 5+5 or from 2 to 10. Generally, Gleason scores of 2 to 4 are uncommon; as a result, the majority of detected tumors range from 5 to 10. High-Grade Cancer With each increase in tumor score (e.g., from Gleason 5 to 6), there is an increase in tumor aggressiveness. High-grade cancer commonly refers to the most aggressive of tumors, generally Gleason scores of 8 to 10 (the most aggressive group), but also can include Gleason 7 tumors [(33)].

Tumor Stage Tumor stage refers to the degree to which the tumor has involved the prostate gland or has spread. As with other tumors, prostate cancers that involve only a small portion of the prostate are more successfully treated than those that have extended throughout the gland. Similarly, tumors that remain confined to the prostate are also more successfully treated than those that have extended beyond the confines of the gland [(33)].

Finally, tumors that have spread to sites remote to the prostate (e.g., metastatic disease in lymph nodes or bone) have the poorest outcomes. American Joint Committee on Cancer (AJCC): The stage of prostate cancer depends mainly on whether the tumor has invaded nearby tissue, such as the bladder or rectum, whether prostate cancer cells have spread to lymph nodes or other parts of the body, such as the bones, grade (Gleason score) of the prostate tumor, PSA level: Stage I The cancer is only in the prostate. It might be too small to feel during a digital rectal exam. If the Gleason score and PSA level are known, the Gleason score is 6 or less, and the PSA level is under 10 [(33)].

Stage II: the tumor is more advanced or a higher grade than Stage I but the tumor doesn’t extend beyond the prostate. Stage III: the tumor extends beyond the prostate. The tumor may have invaded a seminal vesicle, but cancer cells haven’t spread to lymph nodes. Stage IV: the tumor may have invaded

the bladder, rectum, or nearby structures (beyond the seminal vesicles). It may have spread to lymph nodes, bones, or other parts of the body [33].

The application of radiation therapy (RT) has been reportedly extended for use in treatment of International Federation of Gynecology and Obstetrics (FIGO) stage IB1 to IVA cervical cancers .In particular, RT is considered an adjuvant therapy after surgery based on histologic intermediate- or high-risk factors, or as a primary therapy in lieu of surgery. Moreover, concurrent chemo-radiation) CCR) has been established as being more effective than RT alone because chemotherapy has been shown to increase the sensitivity of tumor cells to radiation and to control both local and systemic disease manifestations [34].

Since 2000, cisplatin-based CCR has been found to be the most effective treatment for patients with high-risk early-stage or locally advanced cervical cancer .and various types of single agent or combination chemotherapies including cisplatin, hydroxyurea, ifosfamide and 5-flurouracil (5-FU) have been introduced in order to improve clinical outcomes in patients ,Furthermore, consolidation chemotherapy using epirubicin, 5-FU and cisplatin after CCR has been reported to enhance local control and promote eradication of distant micro-metastases in locally advanced cervical cancer [34].

To identify the prognostic factors for locally advanced cervical cancer patients treated by intensity-modulated radiotherapy (IMRT) and concurrent cisplatin-based chemotherapy. A total of 125 patients with stage IB2–III cervical carcinoma were treated with IMRT and concurrent cisplatin-based chemotherapy, plus high dose rate (HDR) brachytherapy between January 2004 and November 2010, in our institution [35].

All patients received external irradiation of 45–54 Gy with the IMRT technique and concurrent cisplatin-based chemotherapy monthly or weekly. HDR brachytherapy of 20–30.5 Gy was prescribed to point A, as a local boost. Prognostic factors including age, histology, stage, lymph nodes metastasis, pretreatment hemoglobin level, serum squamous cell carcinoma antigen (serum SCC-Ag), chemotherapy regimens and the cumulative dose of weekly cisplatin, were analyzed [35].

The endpoints were overall survival (OS), local failure-free survival (LFFS) and disease-free survival (DFS).The median follow-up time was 42 months. The 4-year OS, LFFS and DFS were 73.8%, 77.9% and 67.2%, respectively. Four (3.2%) patients developed ≥grade 3 acute gastrointestinal (GI)

toxicity and 29 (23.2%) patients developed ≥grade 3 acute hematological toxicity. Five (4.0%) patients developed ≥grade 3 late GI toxicity and seven (5.6%) patients developed ≥grade 3 late genitourinary system toxicity [35].

On univariate analysis, adenocarcinoma was a poor prognostic factor for OS, LFFS and DFS. Patients with lymph nodes metastasis at diagnosis had worse OS . The high cumulative dose of cisplatin (>180 mg/m^2) had better OS and tended to have better survival on LFFS and DFS. On multivariate analysis, adenocarcinoma was a significant independent prognostic factor for OS, LFFS and DFS. Initial lymph nodes metastasis was an independent predictor of OS. Cumulative dose of weekly cisplatin significantly affected OS, and high cumulative dose of cisplatin tended to have better LFFS. Higher pretreatment hemoglobin level had better LFFS [35].

Subjects & methods

(Study design)

This is a cross sectional study to describe the Pattern of malignancies on radiotherapy treatment versus chemotherapy treatment in oncology unit in Suez Canal University Hospital in Ismailia-Egypt

(Study population)

The study is comprehensive on all patients in oncology unit in Suez Canal University Hospital in Ismailia-Egypt in one month.

(Study setting)

oncology unit in Suez Canal University Hospital in Ismailia-Egypt.

(Sample size)

Convenience Sample.

Data collection

Data was collected by structured interview Questionnaire including personal data like name, age, gender, address and if female ask about the menstrual cycle regularity. We asked about the malignancy data like the type, stage, metastasis, complications, when to confirm the tumor, history of previous course of treatment and complications of the treatment.

Data Management

The collected data was coded and the coded information was entered into Microsoft Excel program forming a single work sheet.

The Excel work sheet was entered into Statistical Package of Social Sciences (SPSS-17) program for statistical analysis.

Descriptive data was managed according to its type; mean, standard deviation and range was summarized continuous data, while qualitative data was summarized by frequencies.

In analytical data, chi square test was used to detect the difference between qualitative data, while T test was used to detect difference between continues data.

Ethical consideration

1. The project should be politically and religiously accepted.
2. The study should be approved by the ethical committee of the faculty of medicine Suez Canal University.
3. The permission of the Suez Canal University hospital will be taken.
4. Permission is taken from the Head of the department or place of study (every group add their specific study setting).
5. Informed verbal voluntary consent from participants will be obtained.
6. The participant is informed that he/she has the opportunity to decide to consent or not without intervention of any element of force, fraud, deceit, duress, or undue influence on the subject decision.

7. Information confidentiality should be kept in analysis and data collection.
8. The research material and information will be shared with others aiming advances in medical knowledge.
9. Feedback of the results of the study will be given to the faculty of medicine Suez Canal University.

Time table

Month / Task	Nov. 2013	Dec. 2013	Jan. 2014	Feb. 2014	Mar. 2014	Apr. 2014
Preparation of the protocol	■					
Literature review	■	■				
Preparation of the questionnaire		■				
Data collection		■				
Data entry			■			
Analysis				■		
Discussion					■	
Finalizing and presentation						■

Budget

Item	L.E
1- Internet search	20
2- Printing protocol	30
3- Printing Questionnaire	40
4- Printing final booklet & presentation	50
5- Printing final Poster	60
6- Final presentaion	40
7- Facilities and publishment	60
Total	300

Results

Analysis of the whole types of malignancies

1-Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less thane 40 years	3	10.3	10.3	10.3
	From 40 years to 55 years	9	31.0	31.0	41.4
	Mora than 55 years	17	58.6	58.6	100.0
	Total	29	100.0	100.0	

Table 1: This table shows the age of patients in our study & it shows that more than 58% percent of our study are more than 50 years old, 10% less than 40 years & 31 % between 40 & 50 years.

2-Do you smoke?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	3	10.3	10.3	10.3
	No	26	89.7	89.7	100.0
	Total	29	100.0	100.0	

Table 2: This table shows prevalence of smoking patients in our study & it shows that only 10% of patients are smokers & about 90 % are non-smokers.

3-Are you obese?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	8	27.6	27.6	27.6
	No	21	72.4	72.4	100.0
	Total	29	100.0	100.0	

Table 3: Table shows that 27.6% of patients are obese and about 72.4 are not obese.

4-Do you have any chronic diseases?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Hypertension	6	20.7	26.1	26.1
	Diabetes Mellitus	5	17.2	21.7	47.8
	Others	12	41.4	52.2	100.0
	Total	23	79.3	100.0	
Missing	Not Applicable	6	20.7		
Total		29	100.0		

Table 4: Table shows the chronic diseases among patients and it reveal that 26.1% are hypertensive and about 21.7% are diabetic patients.

5-Type of your cancer?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Breast	20	69.0	69.0	69.0
	Lymphoma	5	17.2	17.2	86.2
	Colon	1	3.4	3.4	89.7
	Leukemia	3	10.3	10.3	100.0
	Total	29	100.0	100.0	

Table 5: This table shows common types of cancer treated which reveals that 69 % of them are breast cancer, 17.2 % are lymphoma, 3.4% cancer colon, and 10.3% are Leukemia.

6-In which stage did you discover the cancer ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Early stage	20	69.0	69.0	69.0
	Advanced stage	9	31.0	31.0	100.0
	Total	29	100.0	100.0	

Table 6: It's about the stage of discovering the cancer. It shows that 69 % are discovered in early stage and about 31 % are in advanced stage.

7- Duration between discovering the disease and start of treatment?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than a month	15	51.7	51.7	51.7
	From one month to 6 months	12	41.4	41.4	93.1
	More than 6 months	2	6.9	6.9	100.0
	Total	29	100.0	100.0	

Table 7: This table shows the duration between discovering the disease and start treatment and about 51.7 % were started treatment within less than one month, 41.4 within one to six months and 6.9 % within more than 6 months.

8-Type of treatment?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Chemotherapy	15	51.7	51.7	51.7
	Radiotherapy	2	6.9	6.9	58.6
	Both	12	41.4	41.4	100.0
	Total	29	100.0	100.0	

Table 8: This table shows type of treatment of patient and the result is 51.7% of patient treated by chemotherapy, 6.9 % of patient treated by Radiotherapy and 41.4 treated by both radio & chemo therapy.

9-Chemotherapy complications?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Loss of appetite	2	6.9	7.1	7.1
	Vomiting	3	10.3	10.7	17.9
	Hair loss	6	20.7	21.4	39.3
	All previous complications	16	55.2	57.1	96.4
	Others	1	3.4	3.6	100.0
	Total	28	96.6	100.0	
Missing	Not Applicable	1	3.4		
Total		29	100.0		

Table 9: This table shows chemotherapy complications and it reveals that the complications were about 7.1% loss of appetite, 10.7% Vomiting, 21.4 % Hair loss, about 57.1% All previous complications mainly (loss of appetite , vomiting , hair loss) and other patients about 3.6 % complain of other complications.

10-Radiotherapy complications?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Vomiting	1	3.4	7.1	7.1
	Hair loss according to treated area	1	3.4	7.1	14.3
	Fatigue	2	6.9	14.3	28.6
	All previous complications	5	17.2	35.7	64.3
	Others	5	17.2	35.7	100.0
	Total	14	48.3	100.0	
Missing	Not Applicable	15	51.7		
Total		29	100.0		

Table 10: This table shows Radiotherapy complications and it reveals that the complications were about 7.1% vomiting, 7.1% Hair loss according to treated area, 14.3% Fatigue, about 35.7% All previous complications mainly (vomiting , hair loss , Fatigue)and other patients about 35.7% complain of other complications.

11-Did you have any other cancers before?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	2	6.9	6.9	6.9
	No	27	93.1	93.1	100.0
	Total	29	100.0	100.0	

Table 11: This table shows that if patients have other cancer before and reveal that 6.9% have cancer before and 93.1 % didn't have.

12-How do you start the chemotherapy/radiotherapy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	As a Primary treatment	10	34.5	34.5	34.5
	As a assistant treatment	3	10.3	10.3	44.8
	With surgery	16	55.2	55.2	100.0
	Total	29	100.0	100.0	

Table 12: This table shows the method that the patients start treatment (chemo/radiotherapy) and revealed that 34.5% start it as a primary treatment, 10.3% as an assistant treatment, while 55.2% with Surgery.

Analysis of the breast cancer

1-Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less thane 40 years	1	5.0	5.0	5.0
	From 40 years to 55 years	7	35.0	35.0	40.0
	Mora than 55 years	12	60.0	60.0	100.0
	Total	20	100.0	100.0	

Table 1: This table shows that 5% of the breast cancer patients are less than 40 years old, 35% of them are from 40 years old to 55 years old and 60% of them are more than 55 years old.

2-How did you discover Breast Cancer?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Breast mass	16	80.0	80.0	80.0
	Breast pain	1	5.0	5.0	85.0
	Others	3	15.0	15.0	100.0
	Total	20	100.0	100.0	

Table 2: This table shows how the patient discovered breast cancer. It reveals that 80 % of patients discovered the breast cancer by discovered breast mass while only 5% of the patients were presented by breast pain.

3-When did you discover Breast Cancer ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than 6 months	6	30.0	30.0	30.0
	More than 6 months	14	70.0	70.0	100.0
	Total	20	100.0	100.0	

Table 3: This table shows when the patients discovered breast cancer. It reveals that 70% of the patients discovered breast cancer for more than 6 months duration while only 30% of the patients discovered breast cancer for less than 6 months duration.

4-What is the Complication of the Breast Cancer?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Loss of Appetite	2	10.0	10.0	10.0
	Weight loss	3	15.0	15.0	25.0
	Breast pain	6	30.0	30.0	55.0
	Arm pit masses	2	10.0	10.0	65.0
	Others	3	15.0	15.0	80.0
	9	4	20.0	20.0	100.0
	Total	20	100.0	100.0	

Table 4: This table shows the most common complications of breast cancer. It shows that the most common complication is breast pain which represents 30%, then weight loss which represents 15%, loss of appetite & arm pit masses represent the same percent (10%), and other complications represent 15%.

5-In which stage did you discover the cancer?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Early stage	13	65.0	65.0	65.0
	Advanced stage	7	35.0	35.0	100.0
	Total	20	100.0	100.0	

Table 5: The previous table shows the stage of discovering the disease and it revealed that discovering it at early stage was 65% which is more common than discovering it at late stage which was 35%.

6-Duration between discovering the disease and start of treatment ?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Less than a month	11	55.0	55.0	55.0
	From one month to 6 months	8	40.0	40.0	95.0
	More than 6 months	1	5.0	5.0	100.0
	Total	20	100.0	100.0	

Table 6: The previous table shows the duration between discovering the disease and start of treatment and it revealed that55% were started treatment within less than one month, 40% within one to six months and 5% within more than 6 months.

7-Type of treatment?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Chemotherapy	7	35.0	35.0	35.0
	Radiotherapy	2	10.0	10.0	45.0
	Both	11	55.0	55.0	100.0
	Total	20	100.0	100.0	

Table 7: The previous table is about the type of treatment used in breast cancer patients and it shows that 55% of them had chemotherapy and radiotherapy, 35% had chemotherapy only, and 10% had radiotherapy only.

8-How do you start the chemotherapy/radiotherapy?

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	As a Primary treatment	4	20.0	20.0	20.0
	As a assistant treatment	2	10.0	10.0	30.0
	With surgery	14	70.0	70.0	100.0
	Total	20	100.0	100.0	

Table 8: The previous table is about the modality of using chemotherapy and radiotherapy in breast cancer patients and it shows that 70% of them used surgery with it, 20% used it as primary treatment, and 10% used it as assistant treatment.

Analysis of the whole types of malignancies

1-Age

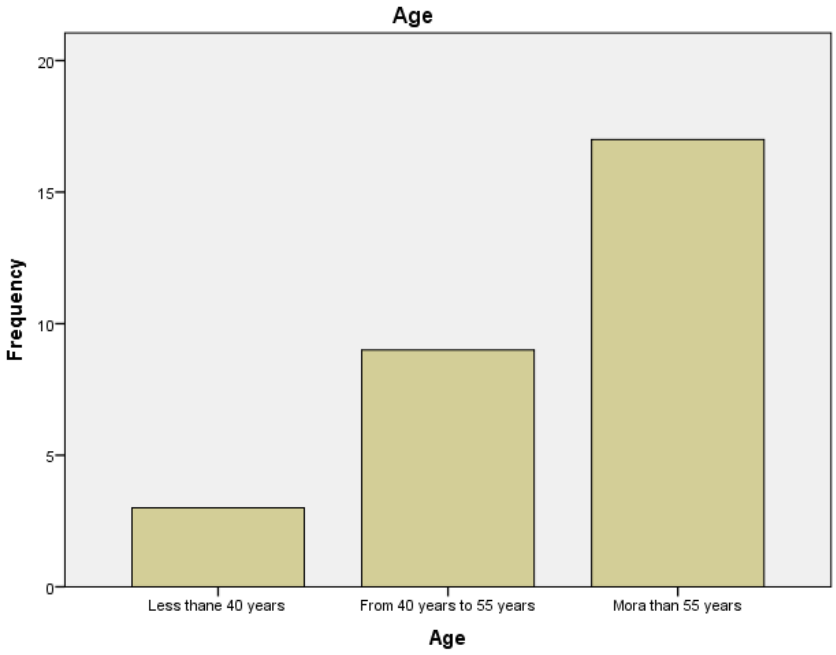


Figure1 : This figure shows the age of patients in our study & it shows that more than 58% percent of our study are more than 50 years old, 10% less than 40 years & 31 % between 40 & 50 years.

2-Do you smoke?

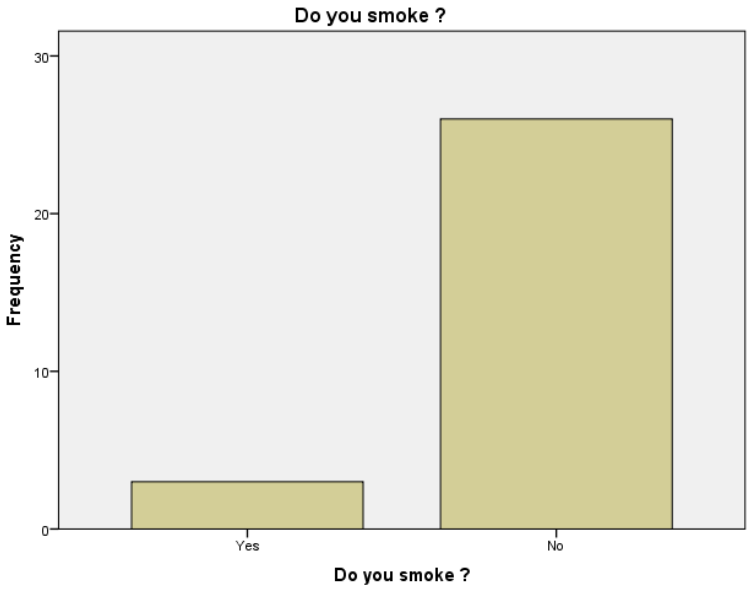


Figure2: This figure shows prevalence of smoking patients in our study & it shows that only 10% of patients are smokers & about 90 % are non-smokers.

3-Are you obese?

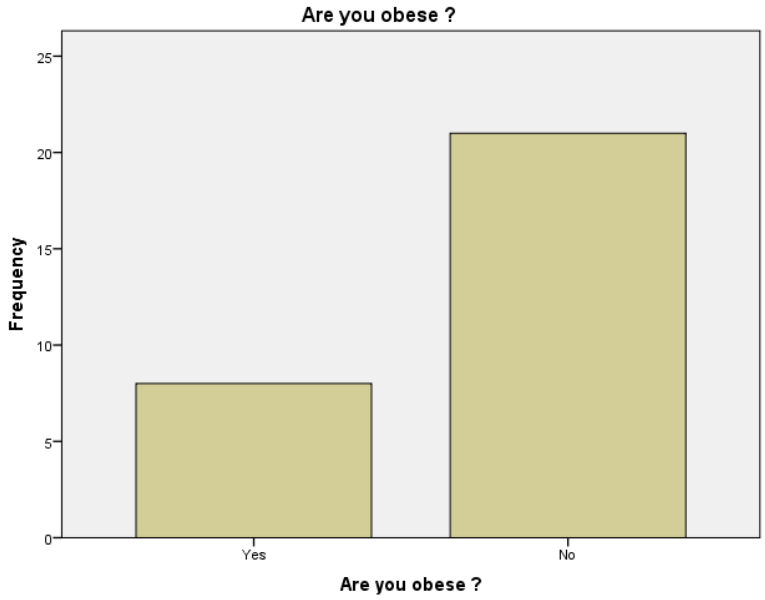


Figure3: shows that 27.6% of patients are obese and about 72.4 are not obese .

4-Do you have any chronic diseases?

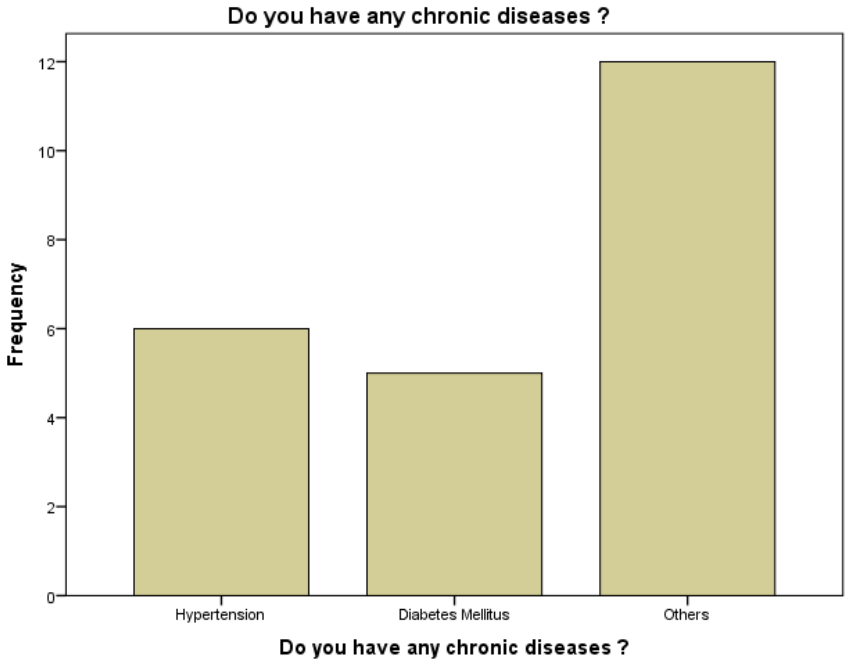


Figure 4: shows the chronic diseases among patients and it reveal that 26.1% are hypertensive and about 21.7% are diabetic patients.

5-Type of your cancer?

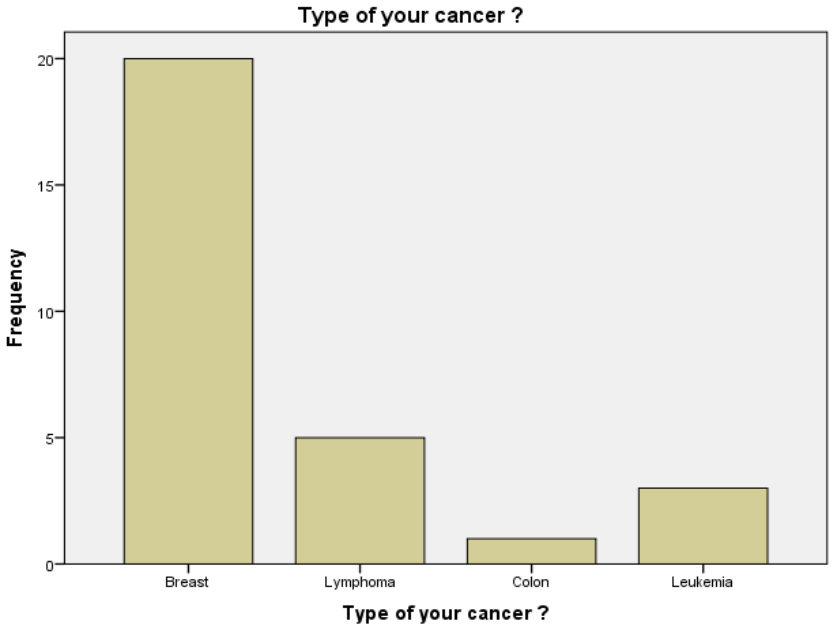


Figure 5: shows common types of cancer treated which reveals that 69 % of them are breast cancer, 17.2 % are lymphoma, 3.4% cancer colon, and 10.3% are Leukemia.

6-In which stage did you discover the cancer ?

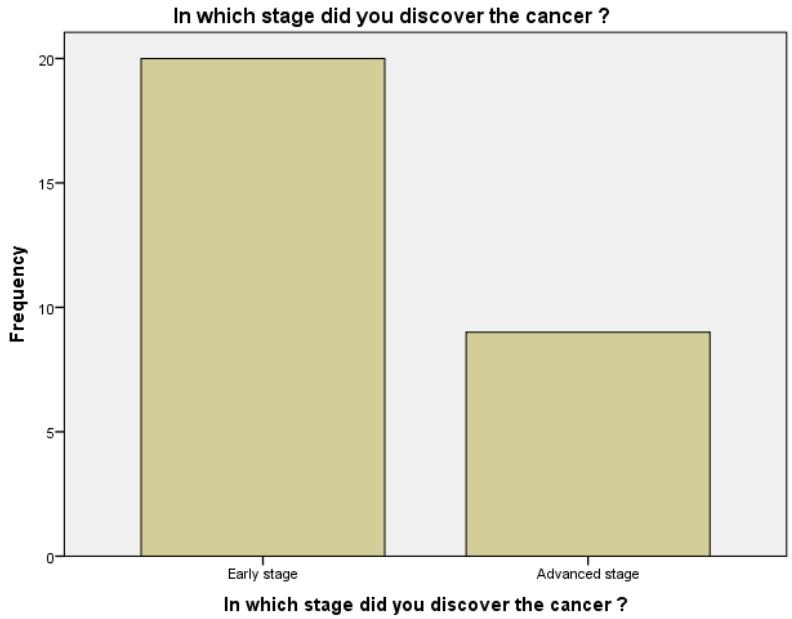


Figure 6 : It's about the stage of discovering the cancer. It shows that 69 % are discovered in early stage and about 31 % are in advanced stage.

7- Duration between discovering the disease and start of treatment?

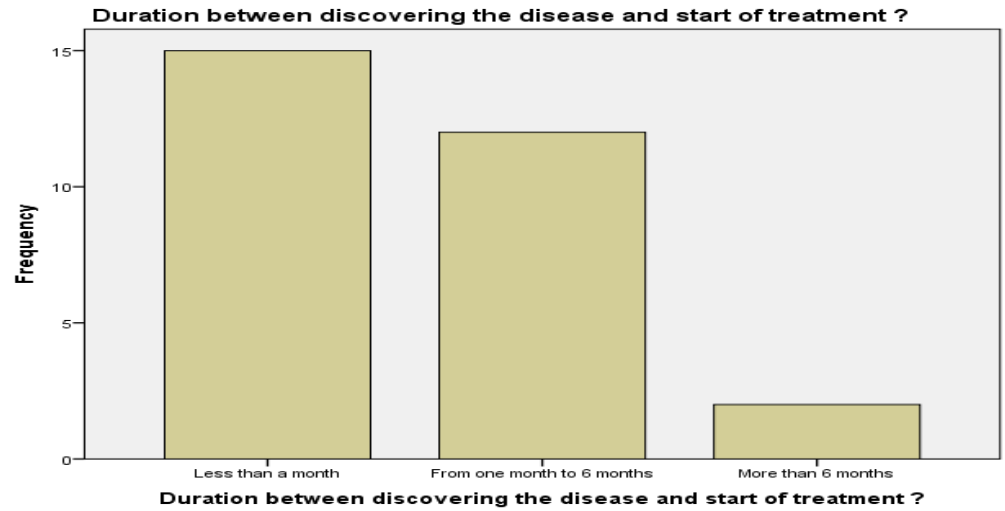


Figure 7 : shows the duration between discovering the disease and start treatment and about 51.7 % were started treatment within less than one month, 41.4 within one to six months and 6.9 % within more than 6 months.

8-Type of treatment?

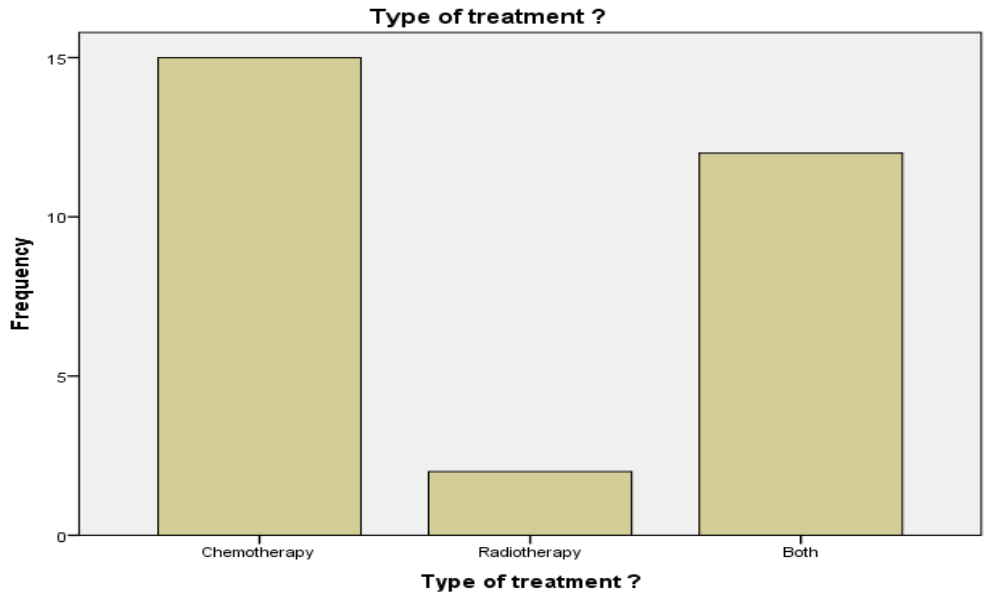


Figure 8: This table shows type of treatment of patient and the result is 51.7% of patient treated by chemotherapy, 6.9 % of patient treated by Radiotherapy and 41.4 treated by both radio & chemo therapy.

9-Chemotherapy complications?

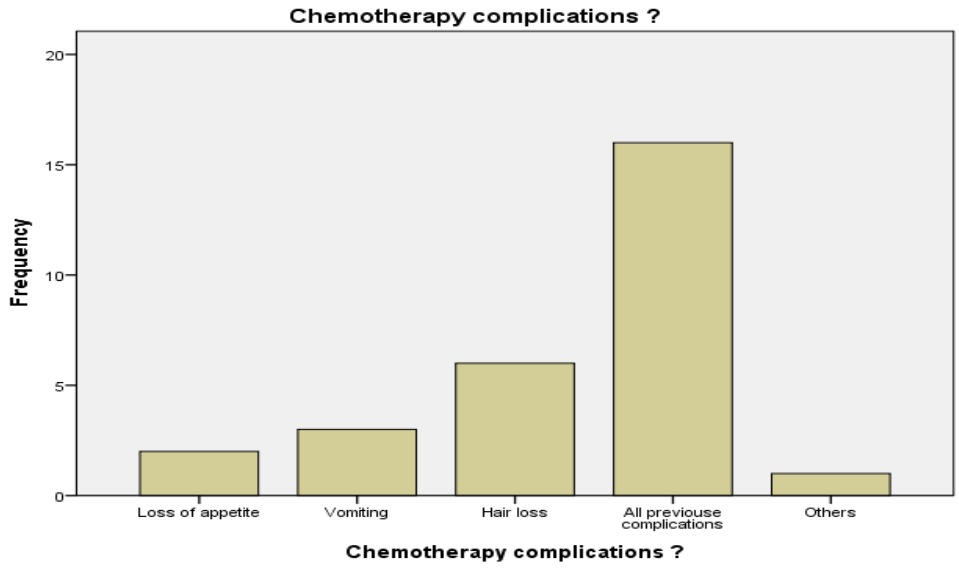


Figure 9: shows chemotherapy complications and it reveals that the complications were about 7.1% loss of appetite, 10.7% Vomiting, 21.4 % Hair loss, about 57.1% All previous complications mainly (loss of appetite , vomiting , hair loss) and other patients about 3.6 % complain of other complications.

10-Radiotherapy complications?

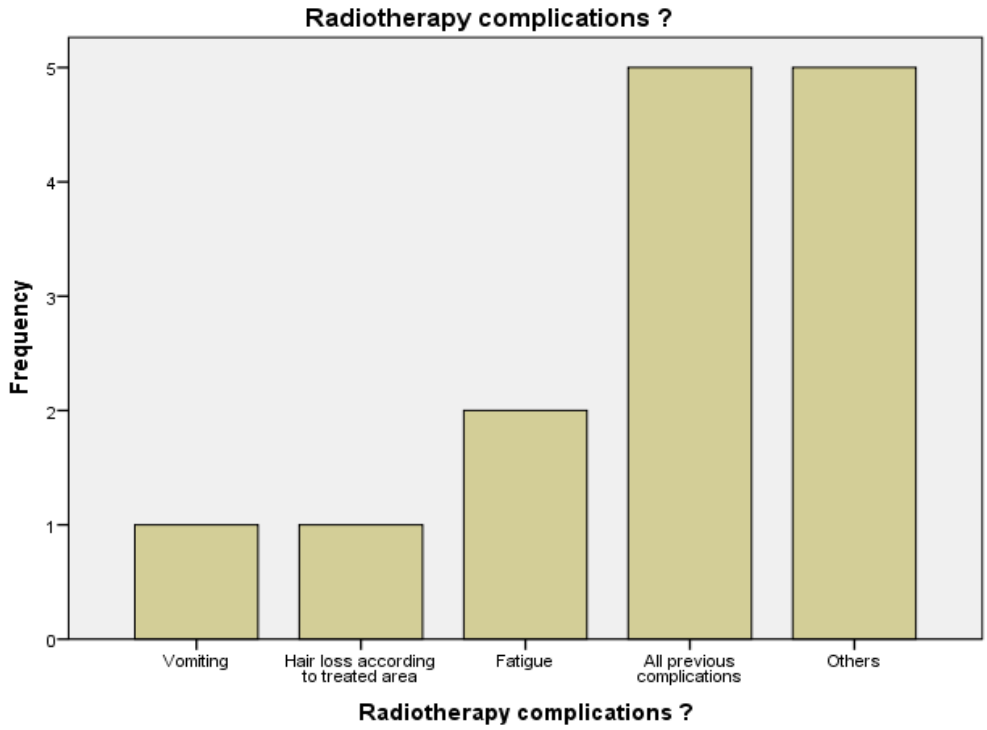


Figure 10: shows Radiotherapy complications and it reveals that the complications were about 7.1% vomiting, 7.1% Hair loss according to treated area, 14.3% Fatigue, about 35.7% All previous complications mainly (vomiting , hair loss , Fatigue)and other patients about 35.7% complain of other complications.

11-Did you have any other cancers before?

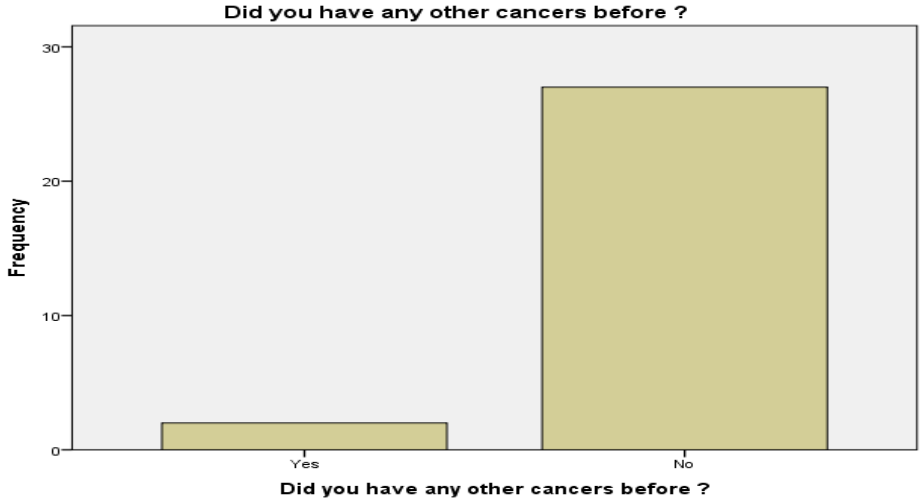


Figure 11: :shows that if patients have other cancer before and reveal that 6.9% have cancer before and 93.1 % didn't have.

12-How do you start the chemotherapy/radiotherapy?

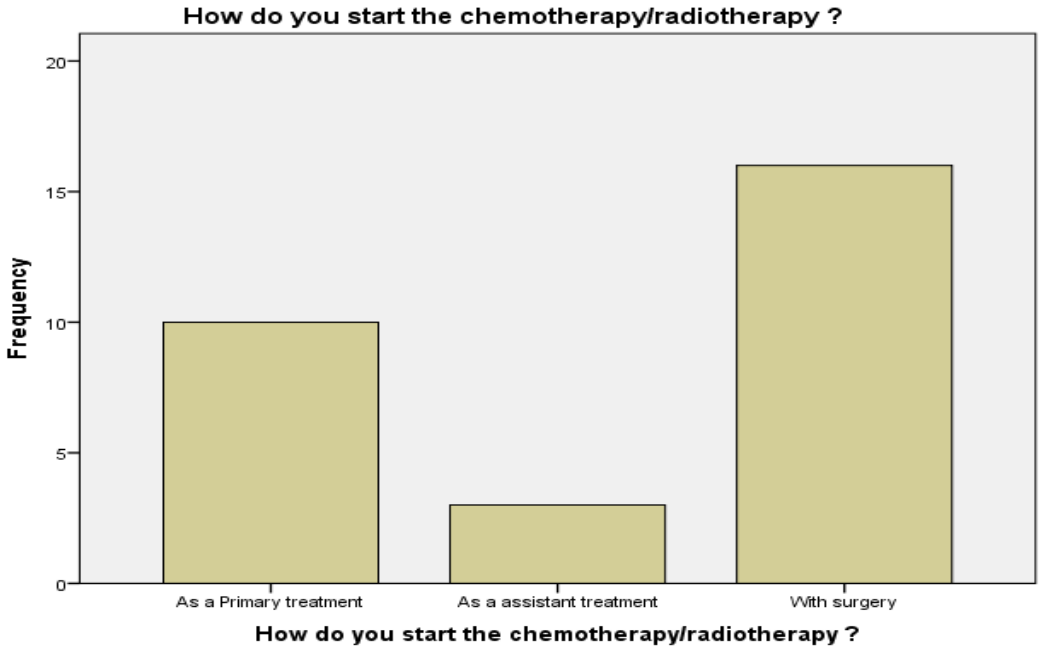


Figure 12: shows the method that the patients start treatment (chemo/radiotherapy) and revealed that 34.5% start it as a primary treatment, 10.3% as an assistant treatment, while 55.2% with Surgery.

Analysis of the breast cancer

1-Age

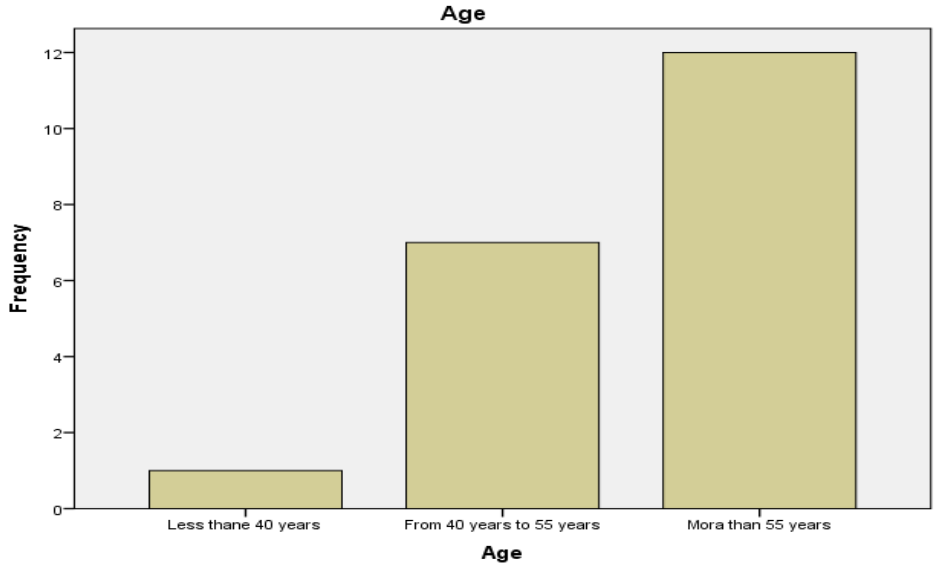


Figure 1: shows that 5% of the breast cancer patients are less than 40 years old, 35% of them are from 40 years old to 55 years old and 60% of them are more than 55 years old.

2-How did you discover Breast Cancer?

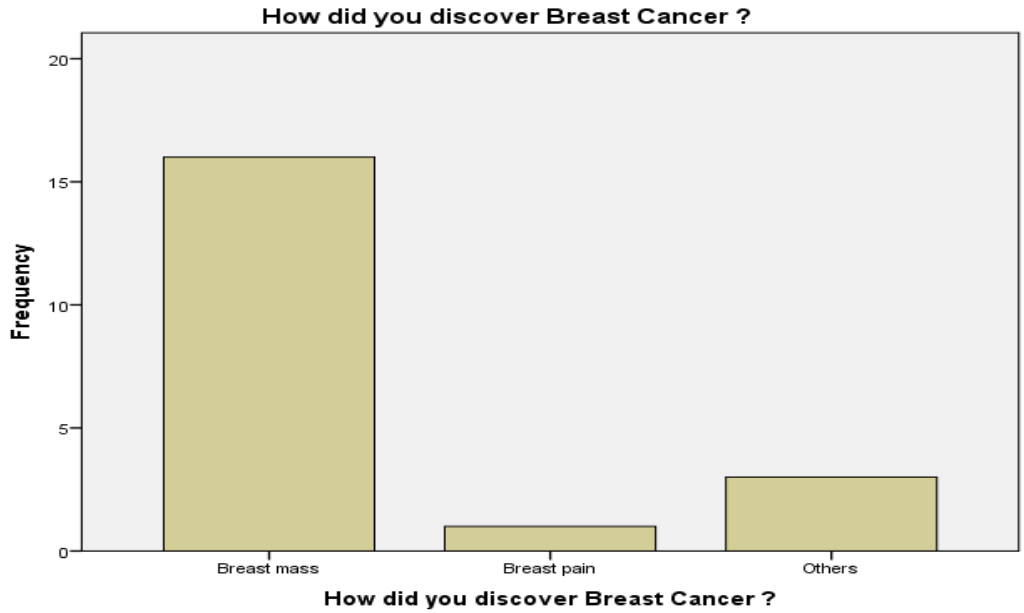


Figure 2: shows how the patient discovered breast cancer. It reveals that 80 % of patients discovered the breast cancer by discovered breast mass while only 5% of the patients were presented by breast pain.

3-When did you discover Breast Cancer ?

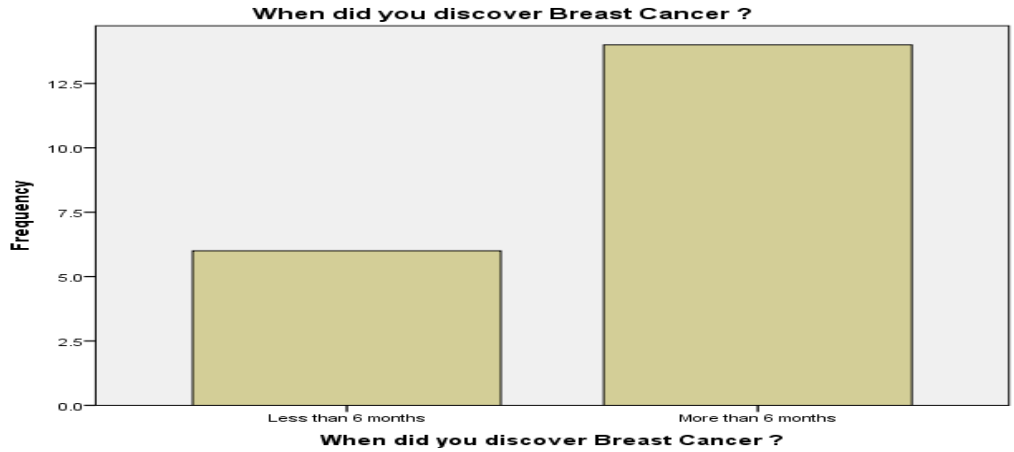


Figure 3: shows when the patients discovered breast cancer. It reveals that 70% of the patients discovered breast cancer for more than 6 months duration while only 30% of the patients discovered breast cancer for less than 6 months duration.

4-What is the Complication of the Breast Cancer?

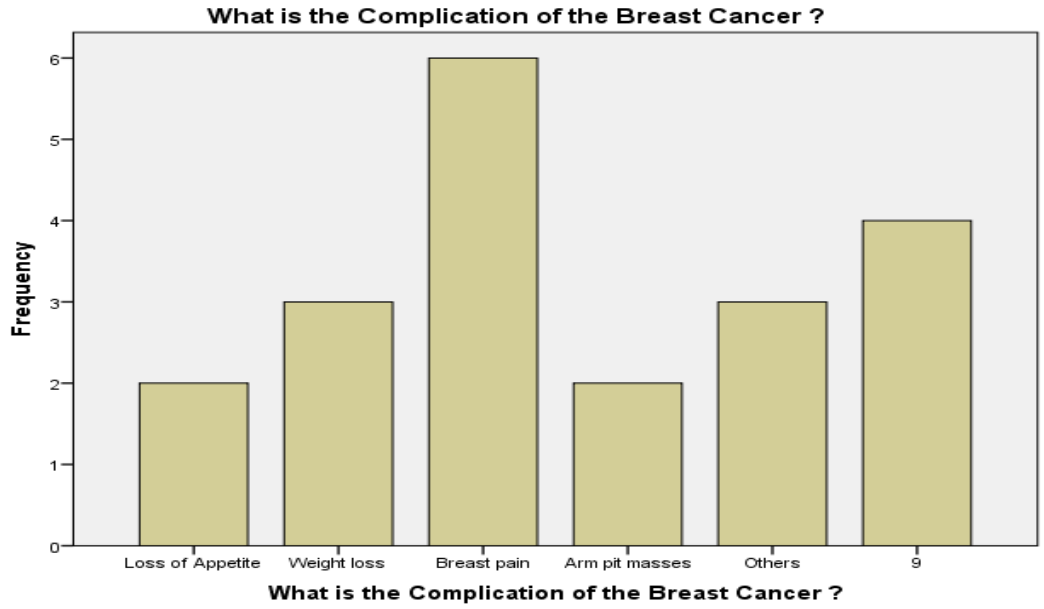


Figure 4 : shows the most common complications of breast cancer. It shows that the most common complication is breast pain which represents 30%, then weight loss which represents 15%, loss of appetite & arm pit masses represent the same percent (10%), and other complications represent 15%.

5-In which stage did you discover the cancer?

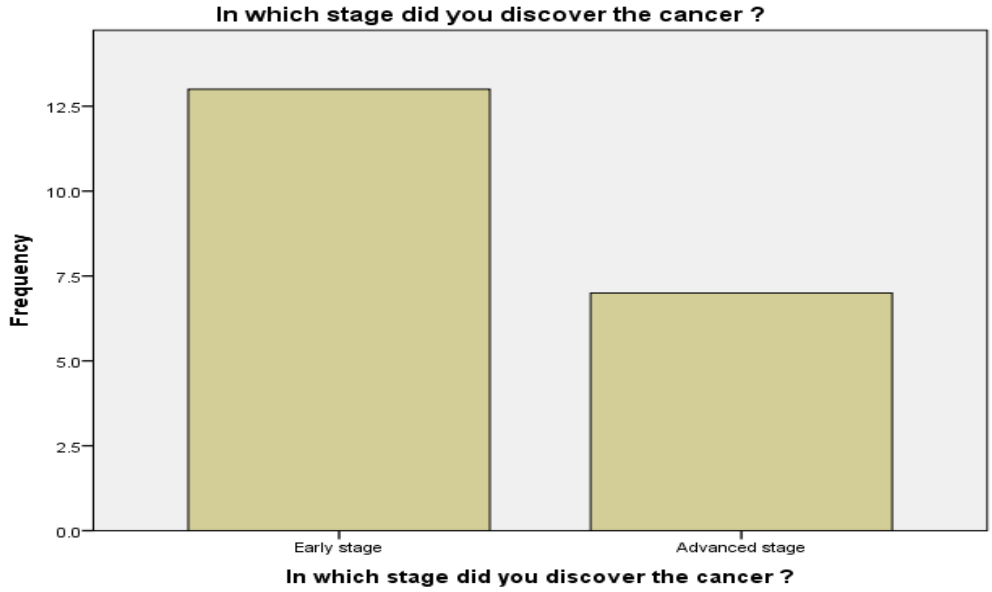


Figure 5: shows the stage of discovering the disease and it revealed that discovering it at early stage was 65% which is more common than discovering it at late stage which was 35%.

6-Duration between discovering the disease and start of treatment ?

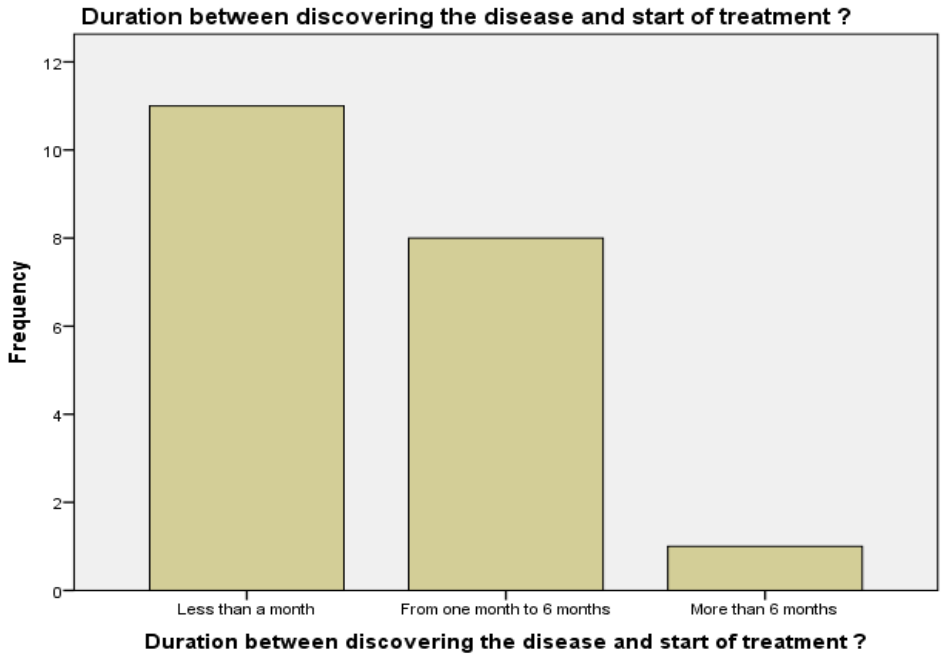


Figure6 : shows the duration between discovering the disease and start of treatment and it revealed that55% were started treatment within less than one month, 40% within one to six months and 5% within more than 6 months.

7-Type of treatment?

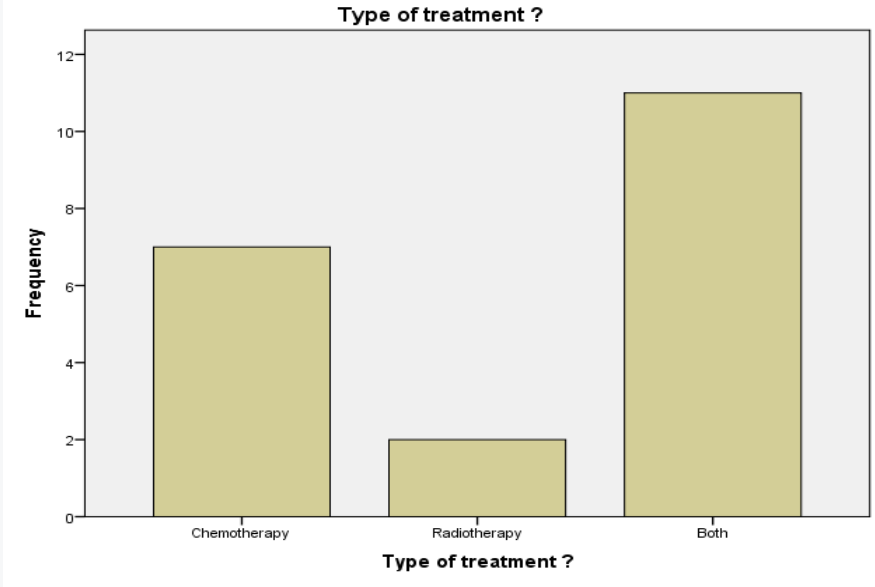


Figure 7: is about the type of treatment used in breast cancer patients and it shows that 55% of them had chemotherapy and radiotherapy, 35% had chemotherapy only, and 10% had radiotherapy only.

8-How do you start the chemotherapy/radiotherapy?

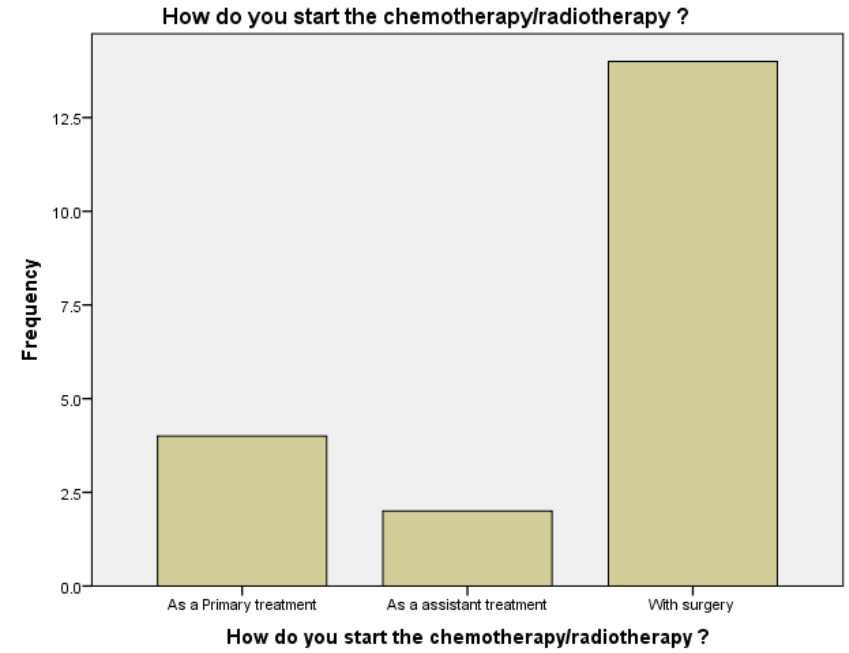


Figure 8: is about the modality of using chemotherapy and radiotherapy in breast cancer patients and it shows that 70% of them used surgery with it, 20% used it as primary treatment, and 10% used it as assistant treatment.

Discussion

Our study aim to know when to use chemotherapy and radiotherapy in treatment of different types of malignancies, to know types of malignancies which need chemotherapy more than radiotherapy in oncology unit and to know pattern of patients who need chemotherapy and radiotherapy in the unit.

Relation between age of patient and method of treatment prescribed for cancer patients

In our study, more than 58% percent of patients who received chemotherapy or radiotherapy are more than 50 years old, 10% less than 40 years & 31 % between 40 & 50 years.

In a study done in Department of Epidemiology and Biostatistics, Memorial Sloan-Kettering Cancer Center in New York, shows that Age at diagnosis was the strongest determinant of chemotherapy: 78% of patients aged 65–69 years, 74% of those aged 70–74 years, 58% of those aged 75–79 years, 34% of those aged 80–84 years, and 11% of those aged 85–89 years received postoperative chemotherapy. The age trend remained pronounced after adjustment for potential confounding based on variation in patients' demographic and clinical characteristics and after exclusion of patients with any evident comorbidity (all *P* values <.001).

In another study published in journal of American medical association on June 2004 , studied effect of age of patient on choice of treatment modality available for different types of cancers , & it stated that increased age of patient worsens prognosis of cancer & shifts treatment modality to palliative ones specifically radiotherapy & chemotherapy & response of patient to any type of them is multifactorial depending on age of patient together with type of cancer, stage, grade , histological subtype & presence of co-morbidities.

The previous data revealed that there is association between the age of the patient and the method of treatment prescribed for him chemotherapy or radiotherapy.

Relation between age of patient and and method of treatment prescribed for breast cancer patients

In our study, 5% of the breast cancer patients are less than 40 years old, 35% of them are from 40 years old to 55 years old and 60% of them are more than 55 years old.

In another study done by the American society of clinical oncology about relationship of patient age to pathologic features of the tumor and prognosis for patients with stage I or II breast cancer shows that Breast cancer patients younger than 35 years have a worse prognosis than older patients above 55 years old. This difference is only partially explained by a higher frequency of adverse pathologic factors seen in younger patients and that affects choice of treatment chemotherapy, radiotherapy, surgical or palliative therapy.

The previous data revealed that the relation between the age of the patient and type of treatment prescribed in breast cancer is affected by the prognosis of the cancer.

Relation between smoking and method of treatment prescribed for cancer patients

In our study, that only 10% of patients are smoking & about 90 % are non-smokers.

In another study published in journal of clinical oncology on July 2002, describing relation between smoking & choice of treatment modality available for patient & it stated that no evidence found on effect of smoking on treatment of cancer patient & choice of treatment option.

Another study published in British Medical Journal shows that smoking cessation after diagnosis of early stage lung cancer improves prognostic outcomes. From life table modelling, the estimated number of deaths prevented is larger than would be expected from reduction of cardiorespiratory deaths after smoking cessation, so most of the mortality gain is likely to be due to reduced cancer progression. These findings indicate that offering smoking cessation treatment to patients presenting with early stage lung cancer may be beneficial.

That means, no relation between smoking and type of treatment prescribed for cancer patient but it may affect prognosis of specific types of cancer like bronchogenic carcinoma.

Relation between obesity and method of treatment prescribed for cancer patients

Our study shows that 27.6% of patients are obese and about 72.4 of patients are not obese.

In another study done in breast cancer research and treatment Journal shows that Women with breast cancer, who are obese, have poorer survival than women with breast cancer, who are not obese. However, no study has elucidated the causal mechanism and there is currently no evidence that weight loss after diagnosis improves survival. The meta-analysis showed poorer survival among obese compared with non-obese women with breast cancer, which was similar for overall (HR = 1.33; 95% confidence interval (CI): 1.21, 1.47) and breast cancer specific survival (HR = 1.33; 95% CI: 1.19, 1.50). The survival differential varied only slightly, depending on whether body mass index (1.33; 1.21, 1.47) or waist–hip ratio (1.31; 1.08, 1.58) was used as the measure of obesity.

That means obesity affects prognosis of cancer especially in breast cancer patients.

Relation between chronic illnesses and method of treatment prescribed for cancer patients

In our study, 26.1% of patients are hypertensive and about 21.7% of them are diabetic patients.

In another study published in Journal of American medical association shows that random-effects model meta-analysis of 23 articles showed that diabetes was associated with an increased mortality HR of 1.41 (95% confidence interval [CI], 1.28-1.55) compared with normoglycemic individuals across all cancer types. Subgroup analyses by type of cancer showed increased risk for cancers of the endometrium (HR, 1.76; 95% CI, 1.34-2.31), breast (HR, 1.61; 95% CI, 1.46-1.78), and colorectal (HR, 1.32; 95% CI, 1.24-1.41).

Patients diagnosed with cancer who have preexisting diabetes are at increased risk for long-term, all-cause mortality compared with those without diabetes.

Most common type of cancer

Our study shows that 69 % of patients are breast cancer, 17.2 % are lymphoma, 10.3% are Leukemia, and 3.4% cancer colon.

A previous study was done in 2002, entitled Global Cancer Statistics showed that:

The most commonly diagnosed cancers are lung (1.35 million), breast (1.15 million), and colorectal (1 million); the most common causes of cancer death are lung cancer (1.18 million deaths), stomach cancer (700,000 deaths), and liver cancer (598,000 deaths). The most prevalent cancer in the world is breast cancer (4.4 million survivors up to 5 years following diagnosis).

That means, Breast cancer is the most common type in oncology department in Suez Canal University

Relation between stage of discovery and method of treatment prescribed for cancer patients in general and breast cancer specifically

Our study shows that 69 % are discovered in early stage and about 31 % are in advanced stages.

It also revealed that discovering breast cancer at early stage was 65% which is more common than discovering it at late stage which was 35%.

In a study published in The New England Journal Of Medicine shows that The five-year actuarial rates of cancer recurrence at any site and of distant metastases in the radiotherapy-first group and the chemotherapy-first group were 38 percent and 31 percent (P = 0.17) and 36 percent and 25 percent (P = 0.05), respectively. Overall survival was 73 percent and 81 percent (P = 0.11), respectively. The five-year crude rates of first recurrence according to site in the radiotherapy-first and chemotherapy-first groups, respectively, were 5 percent and 14 percent for local recurrence and 32 percent and 20 percent for distant or regional recurrence or both. This difference in the pattern of recurrence was of borderline statistical significance (P = 0.07).

This study suggests that for patients at substantial risk for systemic metastases, it is preferable to give a 12-week course of chemotherapy followed by radiation therapy, rather than radiation therapy followed by chemotherapy.

Relation between type of cancer and method of treatment prescribed for it

Our study shows that 51.7% of patient is treated by chemotherapy and 6.9 % of patient treated by Radiotherapy and 41.4 treated by both radio & chemo therapy.

It also shows that 55% of them had chemotherapy and radiotherapy, 35% had chemotherapy only, and 10% had radiotherapy only. It also shows 34.5% of breast cancer patients start it as a primary treatment, 10.3% as an assistant treatment, while 55.2% with Surgery.

In another study published in New England Journal Of Medicine shows that after 15 years of follow-up, the women assigned to chemotherapy plus radiotherapy had a 33 percent reduction in the rate of recurrence (relative risk, 0.67; 95 percent confidence interval, 0.50 to 0.90) and a 29 percent reduction in mortality from breast cancer (relative risk, 0.71; 95 percent confidence interval, 0.51 to 0.99), as compared with the women treated with chemotherapy alone.

Radiotherapy combined with chemotherapy after modified radical mastectomy decreases rates of loco regional and systemic relapse and reduces mortality from breast cancer and that’s the rational which clinicians used in oncology department in Suez Canal University in treatment of breast cancer.

most common complications of chemotherapy and radiotherapy

Our study reveals that the complications of chemotherapy are about 7.1% loss of appetite, 10.7% Vomiting, 21.4 % Hair loss, about 57.1% All previous complications mainly (loss of appetite , vomiting , hair loss) and other patients about 3.6 % complain of other complications.

It also shows that the complications of radiotherapy are about 7.1% vomiting, 7.1% Hair loss according to treated area, 14.3% Fatigue, about 35.7% All previous complications mainly (vomiting , hair loss , Fatigue)and other patients about 35.7% complain of other complications.

Another study published in International Journal of Radiation Oncology*Biology*Physics showa that the frequency of brachial plexopathy, rib fracture, tissue necrosis, pericarditis, and second non-breast malignancies occurring in the treatment field among 1624 patients with early stage breast cancer treated with conservative surgery and radiation therapy at the Joint Center for Radiation Therapy between 1968 and 1985 is reported. The median follow-up time for survivors was 79 months (range 5 – 233 months). Brachial plexopathy was related to the use of a third field, the use of chemotherapy and the total dose to the axilla. Brachial plexopathy developed in 20 of 1117 women (1.8%) who received supraclavicular irradiation with or without axillary irradiation. The median time to its occurrence was 10.5 months (range 1.5 – 77 mo), and the majority (80%) of cases completely resolved. Among patients treated with a three-field technique, the incidence of brachial plexopathy was 1.3% ($^{13}/_{991}$) in patients treated with a dose to the axilla of s 50 Gy, compared with 5.6% ($^{7}/_{126}$) in women treated with an axillary dose of > 50 Gy. The incidence of brachial plexopathy was 4.5% ($^{15}/_{330}$) among patients receiving chemotherapy, compared with 0.6% ($^{5}/_{787}$) when chemotherapy was not used ($p < 0.0001$). Rib fracture was seen in 29 patients (1.8%), at a median time of 12 months following treatment (range 1 – 57). In all cases, the rib fracture healed without intervention. The incidence of rib fracture was 2.2% ($^{28}/_{1300}$) among patients treated on a 4 MV linear accelerator, compared with 0.4% ($^{1}/_{276}$) for patients treated on a 6 or 8 MV machine ($p = 0.05$). Of patients treated on a 4 MV machine, 0.4% ($^{1}/_{279}$) developed a rib fracture when a whole breast dose of 45 Gy or less was given, 1.4% ($^{10}/_{725}$) after receiving between 45 and 50 Gy, and 5.7% ($^{17}/_{296}$) following 50 Gy or higher. Tissue necrosis requiring surgical correction developed in three patients (0.18%) 22, 25, and 114 months after treatment. Presumed pericarditis (requiring hospitalization) was seen in 0.4% of women ($^{3}/_{831}$) who received radiation therapy to the left breast 2, 2, and 11 months after the start of treatment. Three women (0.18%) developed sarcomas in the treatment field at 72, 107, and 110 months, for a 10-year actuarial rate of 0.8%. Two of these sarcomas developed in areas of probable match-line overlap. One patient (0.06%) developed an in-field basal cell carcinoma at 42 months. In conclusion, the risk of significant

complications following conservative surgery and radiation therapy for early stage breast cancer is low. Small alterations in treatment, such as using a 6 MV machine and limiting the dose to the whole breast and axilla to 50 Gy or lower, may reduce their occurrence.

Recommendation

The following is recommended to help decision making in choose method of treatment of different cancer types and breast cancer specifically and to make health education about awareness of complications of chemotherapy and radiotherapy.

1-Decision making in cancer treatment

After a diagnosis of cancer, patients and their families have to make a number of decisions about cancer treatment, some of which are more difficult than others. These decisions are complicated by feelings of anxiety, unfamiliar words, statistics, and a sense of urgency. However, unless the situation is extremely urgent, it is important to allow time to discuss different methods of treatment available and which one is the right for the patient according to the pattern of malignancy and of the patient. Decisions about cancer treatment are personal, and patient needs to feel comfortable with the doctor choices. But, many patients don't know where to start. Here are some simple, but important, steps patient might want to take as he/she starts the decision-making process.

-Understand your diagnosis. Because individual treatment plans depend on the type and stage of the cancer (where the cancer is located, if or where it has spread, and whether it is affecting other parts of the body), it is important to understand as much as you can about your specific diagnosis. To do this, you may want to research the specific cancer type or ask your doctor questions about the disease. Be careful when doing research online, though. Although there are many excellent resources, there are also sites that are frightening, inaccurate, or misleading. Learn more about evaluating cancer information on the Internet. Also, if you are unfamiliar with some of the words that are used, ask a member of your health care team for an explanation or use a medical dictionary.

-Know your options. Talk with your doctor about the treatment options for your type and stage of cancer. Some of these options may include surgery, radiation therapy, chemotherapy, hormone therapy, active surveillance (watchful waiting), palliative care, or participating in a clinical trial. Learning about all of the treatments commonly used for your type of cancer will help you and your doctor form a partnership in your care.

-Understand the goals of treatment. Some treatments may be used to slow, stop, or eliminate the cancer (also called disease-directed treatment), while others may be used to manage symptoms and side effects. This second type of treatment, called palliative or supportive care, is an important part of a person's overall treatment plan and focuses on a person's emotional and social needs. People with cancer often receive disease-directed therapy and treatment to ease symptoms at the same time. When making treatment decisions, it is important to not only understand what you can expect your treatment plan to do in your situation but also to make sure it aligns with your personal goals for treatment. For example, someone who values being as comfortable and free from pain as possible may

talk with his or her health care team about focusing on palliative care if disease-directed treatment will cause serious or unpleasant side effects.

2- Side effects of chemotherapy

-Cytotoxic medicines are powerful and often cause unwanted side-effects. Cytotoxic medicines work by killing cells which are dividing and so some normal cells are damaged too. However, side-effects vary from medicine to medicine.

-Sometimes, if side-effects are particularly severe, a change to a different medicine may be an option.

-Some of the most common and important side-effects are tiredness (fatigue) is a common side-effect, Nausea and vomiting can be common to feel sick (nausea) during and after each cycle of treatment, anemia, serious infections, bleeding problems, hair loss, mouth ulcerations and infections, constipation and neurological problems.

3-Radiotherapy complications

-Side effects from radiation are usually limited to the area of the patient's body that is under treatment. One of the aims of modern radiotherapy is to reduce side effects to a minimum, and to help the patient to understand and to deal with those side effects which are unavoidable.

- The main side effects reported are fatigue and skin irritation, like a mild to moderate sun burn. The fatigue often sets in during the middle of a course of treatment and can last for weeks after treatment ends. The skin irritation will also go away, but it may not be as elastic as it was before. Patients should ask their radiation oncologist or radiation oncology nurse about possible products and medications that can help with side effects.

- Medium and long-term side effects: These depend on the tissue that received the treatment; they may be minimal, fibrosis, hair loss, dryness, fatigue is among the most common symptoms of radiation therapy, cancer as radiation is a potential cause of cancer, and secondary malignancies are seen in a very small minority of patients, death as radiation has potentially excess risk of death from heart disease seen after some past breast cancer RT regimens, and cognitive decline, In cases of radiation applied to the head radiation therapy can cause cognitive decline.

Summary

Choice of cancer treatment is influenced by several factors, including the specific characteristics of cancer; overall condition; and whether the goal of treatment is to cure cancer, keep cancer from spreading, or to relieve the symptoms caused by cancer. Depending on these factors, patient may receive one or more of the following: Surgery, Chemotherapy, Radiation therapy, Hormonal therapy, Targeted therapy, Biological therapy.

We aimed to know when to use chemotherapy and radiotherapy in treatment of different types of malignancies, to know types of malignancies which need chemotherapy more than radiotherapy in oncology unit and to know pattern of patients who need chemotherapy and radiotherapy in the unit.

Our study was a cross sectional type and we used a questionnaire on convenience sample of cancer patients in oncology unit in Suez Canal university hospital in 2 consecutive weeks only. The questionnaire depended on the data we have suspected from the literature review. The total number of cases was 29.

Conclusions

Choice of cancer treatment depend on pattern of cancer type and pattern of cancer patients as the most common type of cancer in the oncology unit was breast cancer in old age patients and the most common modality of treatment used was surgery with post-operative radiotherapy and chemotherapy which have good prognosis and less recurrence and chemotherapy has side effects more than radiotherapy.

Acknowledgement

First of all, praise to ***Allah, the Most Gracious, and the Most Merciful*** *for* His assistance and favor to accomplish this work.

We would like to express our sincere gratitude and thankfulness to:

Prof./ Mostafa Fouad ,Professor of occupational medicine, Community medicine department.

Dr./Noha Mohamed AboBakr, Demonstrator of Public Health Medicine**,** Community medicine department

Dr./ Hebatalla Mohamed Aly ,Demonstrator of occupational medicine, Community medicine department.

For their continuous and ongoing guidance and supervision in every single step of the project and for their constructive criticism.

Special Thanks to everyone who participated in this project.

{**Citation:** Azza S. Ali , Enas R. Mohammed , Hadeer M. Ismail , Naira S. Fahd , Nader A. Abd El-maogod , Noha M. Osman , Mahmoud A. Mohammed , Mahmoud M. Bakr , Mayada A. Hassan , Mohammed G. Mustafa, Walaa S. Galaa. Pattern of malignancies on radiotherapy treatment versus chemotherapy treatment in oncology unit in Suez Canal University Hospital in Ismailia-Egypt. American Journal of Research Communication, 2014, 2(7): 169-226} www.usa-journals.com, ISSN: 2325-4076.

References

1.Ahmedin Jemal DVM, PhD,Freddie Bray PhD, Melissa M. Center MPH, Jacques Ferlay ME, Elizabeth Ward PhD, David Forman PhD , cancer journal for clinicians volume 61 , issue 2 , pages 69-90 april 2011.

2.Merck Manual, Professional Edition, Ch. 253, Breast Cancer.

3.Christos Sotiriou,Soek-Ying Neo, Lisa M. McShane, Edward L. Korn, Philip M. Long, Amir Jazaeri, Philippe Martiat, Steve B. Fox, Adrian L. Harris, and Edison T. Liu, Breast cancer classification and prognosis based on gene expression profiles from a population-based study , Stanford University School of Medicine, Stanford, CA, May 14, 2003 .

4.Marco Colleoni , Giuseppe Viale , David Zahrieh , Giancarlo Pruneri , Oreste Gentilini , Paolo Veronesi , Richard D. Gelber , Giuseppe Curigliano , Rosalba Torrisi , Alberto Luini , Mattia Intra ,Viviana Galimberti , Giuseppe Renne , Franco Nolè , Giulia Peruzzotti , and Aron Goldhirsch Chemotherapy Is More Effective in Patients with Breast Cancer Not Expressing Steroid Hormone Receptors July 1, 2004 .

5.Claude Jacquillat MD, Marise Weil MD, François Baillet MD, Christian Borel MD, Gérard Auclerc MD, M. A. De Maublanc MD, Martin Housset MD, Geneviève Forget PhM, Laurence Thill MD, Claude Soubrane MD, David Khayat MD Results of neoadjuvant chemotherapy and radiation therapy in the breast-conserving treatment of 250 patients with all stages of infiltrative breast cancer28 JUN 2006 .

6.F E Langlands, MD, MRCS1, K Horgan, MD, FRCS, D D Dodwell, MD, FRCR and L Smith, BSc, PhD ,British Journal of Radiology (2013) 86, 20120601.

7.Joseph Ragaz, Ivo A. Olivotto, John J. Spinelli, Norman Phillips, Stewart M. Jackson, Kenneth. S. Wilson, Margaret A. Knowling, Christopher M. L. Coppin, Lorna Weir, Karen Gelmon, Nhu Le, Ralph Durand, Andrew J. Coldman and Mohamed Manji , Locoregional Radiation Therapy in Patients With High-Risk Breast Cancer Receiving Adjuvant Chemotherapy: 20-Year Results of the British Columbia Randomized Trial,September 16, 2004.

8.Lesley Best, Peter Simmonds, Chris Baughan, Roger Buchanan, Carol Davis, Ian Fentiman, Steve George, Margot Gosney, John Northover, Chris Williams, Collaboration Colorectal Meta-analysis Palliative chemotherapy for advanced or metastatic colorectal cancer ; THE Cochrane library ; 24 JAN 2000 .

9.Laura De Caluwé, Yves Van Nieuwenhove, Wim P Ceelen ; Preoperative chemoradiation versus radiation alone for stage II and III resectable rectal cancer ; THE Cochrane library ; 28 FEB 2013 .

10.Anna Dorothea Wagner , Susanne Unverzagt, Wilfried Grothe, Gerhard Kleber, Axel Grothey,Johannes Haerting, Wolfgang E. Fleig Chemotherapy for advanced gastric cancer ; THE Cochrane library ; 17 MAR 2010 .

11.Kim MM, Rana V, Janjan NA, Das P, Phan AT, Delclos ME, Mansfield PF, Ajani JA, Crane CH, Krishnan S Clinical benefit of palliative radiation therapy in advanced gastric cancer ;NBCI ; 2008 .

12.Fernando Pons, Maria Varela, and Josep M. Llovet, Senior Scientist , Staging systems in Hepatocellular carcinoma , ncbi.nlm.nih.gov , 2005 .

13.Miny Samuel, Pierce K-H Chow, Edwin Chan Shih-Yen, David Machin, Khee-Chee Soo Neoadjuvant and adjuvant therapy for surgical resection of hepatocellular carcinoma ; THE Cochrane library 21 JAN 2009 .

14.Sebastian Weis , Annegret Franke, Joachim Mössner, Janus C Jakobsen, Konrad Schoppmeyer Radiofrequency (thermal) ablation versus no intervention or other interventions for hepatocellular carcinoma ; THE Cochrane library ; 19 DEC 2013 .

15.Keith M Baldwin, DO; Chief Editor: Jules E Harris, MD , Esophageal Cancer , emedicine.medscape. Dec 3, 2013 .

16.Nabeya Y, Ochiai T. ; Chemotherapy for esophageal cancer ; NCBI ; 2003 Nov.

17.M al-Sarraf, K Martz, A Herskovic, L Leichman, J S Brindle, V K Vaitkevicius, J Cooper, R Byhardt, L Davis and B Emami ; Progress report of combined chemoradiotherapy versus radiotherapy alone in patients with esophageal cancer: an intergroup study ; 1997 by American Society of Clinical Oncology .

18.Sydney J Arnott (F.R.C.R.), William Duncan, M.D., Marc Gignoux, M.D., David J Girling, M.D., Hanne S Hansen, M.D, B Launois, M.D., Knut Nygaard, M.D., Mahesh K.B Parmar, Ph.D., Alain Roussel, M.D.G Spiliopoulos, M.D., Lesley A Stewart, Ph.D., Jayne F Tierney, Ph.D, , Wang Mei, M.D., Zhang Rugang, M.D. Preoperative radiotherapy in esophageal carcinoma: a meta-analysis using individual patient data (oesophageal cancer collaborative group) ; sciencedirect ; International Journal of Radiation Oncology*Biology*PhysicsVolume 41, Issue 3, 1 June 1998, Pages 579–583 .

19.Maurizio Martelli, Andrés J.M. Ferreri, Claudio Agostinelli, Alice Di Rocco, Michael Pfreundschuh, Stefano A. Pileri, Diffuse large B-cell lymphoma, Critical Reviews in Oncology / Hematology – 01 February 2013 .

20.Liang Wang, Zhong-jun Xia, Hui-qiang Huang, Yue Lu, Yu-jing Zhang, Cyclophosphamide, doxorubicin, vincristine, and prednisone (CHOP) in the treatment of stage IE/IIE extranodal natural killer/T cell lymphoma, nasal type: 13-year follow-up in 135 patients, International Journal of Hematology November 2012, Volume 96, Issue 5 .

21.Eong Il Yu, M.D. Heerim Nam, M.D., M.M.S., Yong Chan Ahn, M.D., Ph.D., Won Seog Kim, M.D., Ph.D., Keunchil Park, M.D., Ph.D., Seok Jin Kim, M.D., Ph.D, Involved-Lesion Radiation Therapy After Chemotherapy in Limited-Stage Head-and-Neck Diffuse Large B Cell Lymphoma, International Journal of Radiation OncologyBiologyPhysics
Volume 78, Issue 2 , Pages 507-512, 1 October 2010 .

22.Naoto Shikama, Masahiko Oguchi, Koichi Isobe, Katsumasa Nakamura, Yoshio Tamaki, Masatoshi, Hasegawa, Takeshi Kodaira, Shigeru Sasaki and Yoshikazu Kagamim, A Long-term Follow-up Study of Prospective 80%-dose CHOP Followed by Involved-field Radiotherapy in Elderly Lymphoma Patients, Japanese Journal of Clinical Oncology, March 2, 2011.

23.Clifton F. Mountain MD, John M. Lukeman MD, Samuel P. Hammar MD, Dean W. Chamberlain MD, Walter F. Coulson MD, David L. Page MD, Thomas A. Victor MD, Louis H. Weiland MD, Lung cancer classification: The relationship of disease extent and cell type to survival in a clinical trials population,LUNG CANCER STUDY GROUP PATHOLOGY COMMITTEEJournal of Surgical Oncology Volume 35, Issue 3, pages 147–156, July 2006 .

24.Chemotherapeutic Management of Stage IV Non-small Cell Lung Cancer* FREE TO VIEW Mark A. Socinski, MD, FCCP; David E. Morris, MD; Gregory A. Masters, MD, FCCP; Rogerio Lilenbaum, MD ,chest journal official publications of american college of chest physicians January 2003, Vol 123, No. 1_suppl.

25.David G. Pfister, David H. Johnson, Christopher G. Azzoli, William Sause, Thomas J. Smith, Sherman Baker Jr, Jemi Olak, Diane Stover, John R. Strawn, Andrew T. Turrisi and Mark R. Somerfield, merican Society of Clinical Oncology Treatment of Unresectable Non–Small-Cell Lung Cancer Guideline: Update 2003journal of clinical oncology vol. 22 no. 2 330-353

26.Shanmugaratnam K, Sobin L: Histological Typing of Upper Respiratory Tract Tumours. Geneva: World Health Organization, 1978. International Histologic Classification of Tumours: No. 19

27.Treatment outcomes and late complications of 849 patients with nasopharyngeal carcinoma treated with radiotherapy alone Shyh-An Yeh, M.D., Yeh Tang, M.D., Chun-Chung Lui, M.D., Yu-Jie Huang, M.D., Eng-Yen Huang, M.D. International Journal of Radiation Oncology*Biology*Physics Volume 62, Issue 3, 1 July 2005, Pages 672–679 .

28.The Additional Value of Chemotherapy to Radiotherapy in Locally Advanced Nasopharyngeal Carcinoma: A Meta-Analysis of the Published Literature J.A. Langendijk, Ch.R. Leemans, J. Buter, J. Berkhof and B.J. Slotman + Author Affiliations journal of clinical oncology JCO November 15, 2004 vol. 22 no. 22 .

29.Ian W. Flinn, Donna S. Neuberg, Michael R. Grever, Gordon W. Dewald,John M. Bennett, Elisabeth M. Paietta, Mohamad A. Hussein,Frederick R. Appelbaum, Richard A. Larson, Dennis F. Moore Jr andMartin S. Tallman, In a study of Trial of Fludarabine Plus Cyclophosphamide Compared With Fludarabine for Patients With Previously Untreated Chronic Lymphocytic Leukemia .

30.Sarah Cannon Research Institute, 250 25th Avenue North, Suite 110, Nashville, TN 37203 .

31.Philip Rubin, M.D,John M. Bennett, M.D., Colin Begg, Ph.D., Marek J. Bozdech, M.D,Robert Silber, M.D. University of Rochester Cancer Center, Rochester, NY (CA 11083) USA Sidney Farber Cancer Institute, Boston, MA (CA 23318) USA Wisconsin Clinical Cancer Center, Madison, WI (CA 21076) USA New York University Medical Center, New York, NY (CA 16395) US .

32.Mohler J, et al. Prostate cancer — Clinical practice guidelines in oncology. The Journal of the National Comprehensive Cancer Network. 2010;8:162.

33.Moynihan TJ (expert opinion). Mayo Clinic, Rochester, Minn. June 9, 2013.

34.Hee Seung Kim, MD, Mi-Kyung Kim, MD, Hak Jae Kim, MD, Seung-Su Han, MD, and Jae Weon Kim, MD, PhD, Phase II Study of Consolidation Chemotherapy after Adjuvant or Primary Concurrent Chemoradiation Using Paclitaxel and Carboplatin to Treat High-Risk Early-Stage or Locally Advanced Cervical Cancer,synapse Journal,June 2012 .

35.Chien-Chih, Chen,Lily, Wang,Jin,Ching Lin,Jian,Sheng Jan, The prognostic factors for locally advanced cervical cancer patients treated by intensity-modulated radiation therapy with concurrent chemotherapy, Journal of the Formosan Medical Association, 07 January .