Efficiency of Chemotherapy and Tamoxifen in Elderly Patients with Breast Cancer

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Abstract

This paper reviews the efficiency and benefits of chemotherapy and Tamoxifen treatments in elderly breast cancer patients. Chemotherapy is a common way to treat cancer and it does this by inhibiting cellular division of cancer cells through intracellular poisons. Tamoxifen is a form of hormonal therapy and it is an estrogen-receptor modulator that is used to prevent and treat breast cancer in women before and after surgery or radiation. After reviewing articles about the two, it was found that chemotherapy and Tamoxifen are beneficial forms of treatment to elderly patients with breast cancer. These treatments should be used in somewhat healthy elderly patients. It was found that tumor characteristics and comorbidities are the main factors that determine survival, not age. Elderly patients should be encouraged to undergo these cancer treatments because of their benefits and increasing survival chance.

Introduction

Cancer is a group of diseases that involves abnormal cell growth that can invade vital organs of the human body. Many elderly people around the world experience some form of cancer in their lifetime. Chemotherapy is one of the most common ways to treat or lessen the effects of many forms of cancer. Chemotherapy is an anti-cancer drug given to cancer patients and its goal is to either eliminate the cancer itself, to lessen the negative effects that the cancer is causing, or to prolong the life of the patient. The goal of chemotherapy is to inhibit cellular division of cancerous cells through the use of intracellular poisons. It can either be delivered intravenously or orally, but the most common way is intravenously. There are many different types chemotherapy drugs available for patients depending on the type of cancer they have. The different types are alkylating agents, antimetabolites, anti-microtubule agents, topoisomerase inhibitors, cytotoxic antibiotics etc. They all have different functions in fighting against cancer. However, this review will be focusing on chemotherapy and a certain drug (Tamoxifen) given to breast cancer patients.

While chemotherapy and Tamoxifen can be a beneficial form of treatment, there are so many side effects that ultimately can make the patients feel and look even more sick. Some common side effects that can occur are immunosuppression, gastrointestinal distress, anemia, fatigue, nausea, vomiting, hair loss, infertility, and organ damage. These side effects can make life for patients unpleasant and potentially life threatening especially elderly patients undergoing large doses of chemotherapy.

It has been questioned whether or not age is a factor in the efficiency of chemotherapy and/or Tamoxifen benefits. The purpose of this paper is to review the advantages and some of the disadvantages of chemotherapy and Tamoxifen treatments for elderly patients and to support that through some research, there is convincing evidence that chemotherapy and Tamoxifen can be beneficial forms of treatment for elderly patients with breast cancer.

*Cancer in the Elderly and the Risk of Dying*

The world’s median life expectancy has significantly increased over the past couple of decades. People are living longer and unfortunately that means more diseases are becoming more prevalent and affecting more elderly people (Berger et al., 2006). Cancer is one of the main diseases affecting the elderly population today. According to Table 1, the rate of cancer diagnoses affecting elderly patients is higher in the age group over 65 years old compared to people under 65 years old. That can be due to weaker immune systems and/or other related illnesses, like heart disease or diabetes. Also, according to the table, cancer mortality is higher in patients aged 65 years and older compared to those younger than 65 years old. Again, that can be contributed to the type of cancer, other illnesses and/or a weak immune system in the elderly patients that are not strong enough to fight off the cancer. The main way the risk of death of cancer is measured is through estimations of life expectancy of the patient and of the age-specific mortality rate of the cancer the patient has (Walter and Covinsky, 2001). In summary, as a patient gets older, the mortality rates of different types of cancers increase while life expectancy of a cancer patient decreases (Walter and Covinsky, 2001). It is important to catch cancer early by getting screenings often, so treatment regiments can be put into place and therefore survival chances can go up.

Table 1. Comparison Table of Cancer Diagnoses and Mortality Rates between Patients Older than 65 years old and Younger.

|  |  |
| --- | --- |
| Over 65 years old | Under 65 years old |
| Cancer diagnosis rate:  2151 per 100,000 | Cancer diagnosis rate:  208 per 100,000 |
| Cancer mortality rate:  1068 per 100,000 | Cancer mortality rate:  67 per 100,000 |

*Cancer, Age, and Comorbidity*

Breast cancer is one of the leading causing of cancer mortality in women across the world (Wiliers et. al., 2007). The risk of getting breast cancer increases with age (Tesarova, 2013). Women who are over the age of 55 and postmenopausal are at an even greater risk of breast cancer due to the number of health problems women after menopause get (Yancik et al., 2001). Those health problems can include heart disease, chronic obstructive pulmonary disease, diabetes, hypertension, or arthritis (Yancik et al., 2001). Elderly patients make up the majority of the population of breast cancer patients, so treating breast cancer can be a challenge as a patient gets older and contracts other illnesses, which is called comorbidity (Wiliers et. al., 2007). Elderly patients need contemplate the risks and benefits when deciding to undergo chemotherapy treatments or hormonal drug treatments, like Tamoxifen (Olver, 2000). Besides breast cancer, colon cancer is another common cancer that can affect elderly people. One study compared the effectiveness of chemotherapy regimens in colon cancer and breast cancer patients. The study found that chemotherapy for breast cancer patients was effective up until the age of 79 while the age for colon cancer patients was in between a range of 80 to 84 years old (Du et al., 2015). The differences in age between the groups are most likely due to patients and their preexisting health conditions. Overall, those ages are promising results and it indicate that chemotherapy can be effective in extending life for cancer patients. Another article where they studied chemotherapy results in patients with different types of advanced cancers and tumors saw that the response rates to aggressive chemotherapy were similar in younger and older patients (Olver, 2000). The results from these articles show that age-related factors like comorbidity, tumor characteristics, and weak physical condition influence the effectiveness of different cancer treatments (Bergman et al., 1991).

*The Efficiency of Tamoxifen*

Tamoxifen (TMX) is not a chemotherapy drug but it can be just as effective as one. It is an estrogen-receptor modulator and is used to prevent and treat breast cancer in women before and after surgery or radiation. The role of this drug is to block cell growth of breast cancer and it does this by interfering with the effects of estrogen in breast tissue. In the 1980’s and early 1990’s, primary surgery and radiation were not recommended to elderly patients due to negative side effects (Allan et al., 1985). Many physicians encouraged patients to take TMX because of encouraging results of reductions of tumors and an increase survival rate (Allan et al., 1985). Many clinical trials have tested whether or not TMX is an effective treatment compared to surgery. They all seem to have reached similar conclusions through similar methods.

One research article done in the early 90’s compared the treatment of both TMX and surgery to just TMX alone (Bates et al., 1991). 381 women over the age of 70 years were separated to the two groups and tested. After 34 months, there was no difference in survival rates between the two groups (Bates et al., 1991). Similarly, two other articles focused their research question on whether TMX or surgery is the best option for primary treatment of breast cancer. However, they have conflicting results. One found that surgery was the optimal treatment (Robertson et al., 1992) while one found that TMX was the optimal primary treatment (Gazet et al., 1988). The results from these articles should not be set in stone. Conflicting results could be due to patients’ existing health conditions and how their body responds to medicine and surgery. Some bodies respond well to medicine while other bodies respond well to surgery. With cancer, there is always a risk of tumors growing back after surgery or drug treatment. Overall, these results from the articles indicate that TMX can be an efficient form of treatment in for elderly patients with breast cancer. It is also gives elderly patients a less aggressive form of treatment if chemotherapy is not the best option for them.

*Benefits of Adjuvant Chemotherapy*

Adjuvant chemotherapy is treatment given to breast cancer patients following a mastectomy. This type of therapy is done to help decrease the chance of the cancer of reappearing. Many older women undergo adjuvant chemotherapy after a mastectomy; however, it has been questioned whether or not adjuvant chemotherapy is efficient for the older patient group because of limited evidence (Elkin et al., 2006). To compile more evidence, clinical trials were performed to test the relationship between the use of adjuvant chemotherapy and the survival rates in a group of older women (66 years and older) with hormone receptor-negative breast cancer (Elkin et al., 2006). Data was compiled through the Surveillance, Epidemiology and End Results cancer registries and Medicare claims (Elkin et al., 2006). The results of these trials showed that adjuvant chemotherapy reduced mortality rates by 15% through the statistics ran. Even though that seems like a small percentage, an overall survival benefit trend was observed in older patients with hormone receptor-negative breast cancer (Elkin et al., 2006).

Another reason why adjuvant chemotherapy is not offered to older patients is because of the high risk of reoccurrence (Muss et al., 2005). More clinical trials were performed to compare the benefits and toxic effects of adjuvant chemotherapy among three patient groups of 50 years and younger, 51 to 64 years old, and 65 years and older (Muss et al., 2005). Data from academic and community medical centers was compiled and analysis showed that smaller tumor size, fewer positive lymph nodes, and more chemotherapy correlated with longer survival and a cancer free life (Muss et al., 2005). Analysis also showed that older and younger women saw a similar trend in reduction of mortality and reoccurrence from regiments that contained more chemotherapy (Muss et al., 2005). Unfortunately, survival was worse for patients 65 years and older because of other illnesses besides breast cancer (Muss et al., 2005). In conclusion, age should not be the only deciding factor in the use of adjuvant chemotherapy in older women in healthy condition.

Conclusion

In conclusion, elderly patients with breast cancer should be treated with chemotherapy or Tamoxifen due to their benefits. According to numerous articles, chemotherapy and TMX are beneficial forms of treatment to elderly patients. It was found that tumor characteristics and comorbidities are the main factors that determine survival, not age. It is important that healthy older women are treated with the same standard chemotherapy and drug treatments as younger women, whether is before or after a mastectomy. There is evidence that older women tend to not have their breast cancer managed in accordance to the national guidelines because of misconceptions of the efficiency of chemotherapy and TMX. This is highly concerning and for future directions, this needs to stop. Women should not let the cancer take over their body because of these misconceptions. They need to be taking the recommended and most effective dose of chemotherapy and/or TMX available. In order to insure this, it is important that physicians and patients are communicating about treatment options. The physicians should not sway the patients from taking chemotherapy and/or TMX unless a patient absolutely cannot take it due to another serious illness or allergy. Patients and physicians should look up scientific journal articles on this topic to be knowledgeable about this topic. Lastly, chemotherapy is something elderly patients should not fear. It is important that they are educated on the benefits and possible side effects of chemotherapy and hormonal therapy.

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