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Research Article

Supportive Care or Specific Treatment? On Elderly Cancer Patients

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Abstract

Objectives: Cancer patients over the age of 75 are less likely to be referred for treatments than younger patients. The purpose of this study was to determine the rates of receive disease-specific treatment or supportive care in patients diagnosed with cancer aged > 75 years.

Methods: The study was conducted retrospectively by scanning the files of patients aged ≥ 75 years who were diagnosed with cancer between January 1, 2018 and December 31, 2019. The patients were divided into two groups: those who could only receive supportive care and those who received disease-specific treatment options. Patients were evaluated individually according to their disease stage, depending on their primary diagnosis.

Results: There were 108 (38.7%) patients with early stage disease and 171 (61.3%) patients with metastatic disease. While 42.7% of the patients received supportive care, 57.3% were able to receive from disease-specific treatment options. Treatments in elderly cancer patients can be difficult and complex.

Conclusion: Age should not be a single criteria when assessing for treatment of cancer patient, stage and type are more important.

Keywords: Chemotherapy, ederly patients, treatment, supportive care

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Life expectancy is increasing in the modern world. Prolonged life expectancy and the aging of the population due to factors, such as the decline of wars, control of epidemics, and advances in medical treatments, require new medical, social, and economic perspectives. The increase in the rate of elderly people in society is described as "The Gray Tsunami" by the World Health Organization (WHO). With advancing age, the incidence of cancer has increased, similar to many comorbid diseases. Patients aged ≥65 years constitute approximately 60% of newly diagnosed cases and 70% of cancer-related deaths.[1,2] The follow-up and treatment of geriatric patients constitute an important and large part of oncological applications, and it is obvious that this rate will increase even more with the Gray Tsunami.

Despite the high incidence of cancer, elderly individuals are under-represented in clinical studies that set standards in oncology practice.[3] As a result, there is less data on the risks and benefits of cancer treatment in geriatric patients.

While performing the medical treatment of cancer, the stage of the disease, the behavior of the tumor, the patient's tolerance to the treatments, and the possible benefits and toxicity of the treatment are evaluated. Older patients are less likely to receive standard cancer treatment compared to younger individuals, which may be due to a

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higher incidence of cancer therapy-related toxicities in geriatric patients, comorbid chronic diseases, difficulty in accessing care, and preference of clinicians and the patient/statutory guardians. All these factors in geriatric oncology patients make clinical practice difficult and may cause differences in treatment preferences among clinicians.

The reason we conducted this research is that patients aged ≥75 years who come in for treatment believe that there are limited treatment options. Furthermore, it is unfortunate that some clinicians share same opinion based on age only. We did not find any study addressing the matter in our literature search.

Objective

In this study, we aimed to examine cancer types, stages, and treatment modalities in patients aged ≥75 years who are diagnosed with cancer. We also aimed to determine the proportion of patients who were given supportive care only without any disease-specific treatment, to examine which treatment is administer for each cancer type, and to evaluate the relationship between cancer stage and treatment.

Methods

Study Design and Population

This study was conducted retrospectively on patients diagnosed with cancer aged ≥75 years who were treated at the medical oncology outpatient clinic between January 1, 2019 and December 12, 2019. The principles of the Helsinki Declaration were followed.

Data Collection

The data were obtained from an electronic medical record system. First, all patients who were applied during this period were listed. Those aged ≥75 years were selected using the age filter. The patients' epicrisis, drug history, medical treatment regimens, and pathology and radiology reports were examined. The patients were divided into groups according to their diagnoses. Those with incompatible pathology and registry data were transferred to the appropriate group in the study. Those with unobtainable were excluded from the study.

The patients were grouped according to stage. Diseases were categorized into two separate groups. Stage 1, 2, and 3 diseases were defined as early-stage disease, and stage 4 disease was defined as metastatic (advanced-stage) disease. In patients with primary brain tumors, low-grade patients were considered to have early-stage disease, and high-grade patients were considered to have advanced-stage disease. In addition, patients were divided into two separate groups: those who were 75-84 years old were designated as "old", and those who were ≥ 85 years old were designated as "very old", and disease distributions and treatments were compared.

Patients were grouped according to the medical treatments they received, such as disease-specific treatments (hormonotherapy, chemotherapy) and supportive care. All patients who could not receive treatment due to medical reasons, such as poor performance status, comorbidities, and inability to undergo treatment due to rejection were included in the supportvive care group. Those who received disease-specific treatment were divided into groups according to the treatments they received. Patients who received a luteinizing hormone releasing hormone (LHRH) analog (leuprolide acetate, goserelin acetate), aromatase inhibitor (anastrazole, letrozole, and exemestane), selective estrogen modulator (tamoxifen), or estrogen receptor antagonist (fulvestrant) due to prostate cancer and breast cancer were included in the hormonotherapy group.

Those who received conventional (cytotoxic) chemotherapy or/and immunotherapy in any period of their treatment were included in the group receiving chemotherapy. Those who received supportive treatment before and were included in the chemotherapy program in their later evaluations were also evaluated in the chemotherapy group. While calculating the rates of those who benefited from disease-specific treatment options, those who received hormonotherapy and those who received chemotherapy were evaluated together. Surgical treatments were not evaluated within the scope of this study.

Statistical Analysis

The Statistical Package for Social Sciences (SPSS) for Windows 21.0 program was used for the statistical analysis of the findings of the study. The Shapiro-Wilk test was used to control the normality distribution of the data. In the study, data with normal and homogeneous distribution were presented as mean value ± standard deviation, and data that did not show normal and homogeneous distribution were presented as numbers and percentages. The chi-square test was used for the analysis of categorical data in the study. The results were evaluated at a 95% confidence interval, and the significance level was set at $p<0.05$.

Results

In this study, a total of 4113 outpatient clinic records were accessed to find patients aged ≥75 years between January 1, 2018 and December 31, 2019, and 305 patients were

within the age group. Data from 279 patients were accessed, and 26 patient documents were not obtained. Of the patients, 58.4% (n=163) were male and 41.6% (n=116) were female.

The average age was 80.27±4.918 overall, while it was 79.72±4.249 in males and 81.04±5.656 in females. Patients between the ages of 75 and 84 constituted 82.1% (n=229) of the total patients, while patients aged ≥85 years constituted 17.9% (n=50) of the total patients.

While 42.7% (n=119) of the patients received only supportive care, 57.3% (n=160) received disease-specific treatment options. While 53.4% (n=62) of the female patients received disease-specific treatment options, 46.6% (n=54) received only supportive care. While 60.1% (n=98) of male patients received disease-specific treatment options, 39.9% (n=65) received only supportive care. There was no relationship between sex and disease-specific treatment (p=0.267).

While 40.2% (n=92) of the patients between the ages of 75 and 84 received only supportive care, 59.8% (n=137) received disease-specific treatment. While 54% (n=27) of the patients aged ≥85 years received supportive care, 46% (n=23) received disease-specific treatment. There was no relationship between the rates of receiving treatment in either age group (p=0.073).

Of the patients, 38.7% (n=108) had early-stage disease and 61.3% (n=171) had metastatic disease. In the 75 to 84 age group, 37.6% (n=86) had early-stage disease, and 62.4% (n=143) had metastatic disease. In the ≥ 85 years age group, 44% (n=22) had early-stage disease, and 56% (n=28) had metastatic disease. When the patients were divided into groups aged 75-84 years and ≥85 years, there was no relationship between age and stage (p=0.406 for–75-84 years old and p=0.607 for ≥85 years).

The distribution of the primary diagnoses of the patients according to age and sex is shown in Table 1. The most common cancers in females aged–75-84 were breast cancer (33.3%, n=30), lung cancer (11.10%, n=10), gastroesophageal cancer (10.0%, n=9), and colorectal carcinoma (8.90%, n=8). In males between the ages of 75 and 84, the most common cancers were prostate cancer (36.70%, n=51), lung cancer (20.10%; n=28), bladder cancer (8.60%; n = 12), and gastroesophageal cancer (7.90%; n=11). The most common cancer in females aged ≥ 85 years was breast cancer (42.30%, n=11) and prostate cancer (45.80%, n=11) in males.

The treatments that the patients received according to their stages and diagnoses are shown in Table 2.

Of the all early-stage patients, 41.7% (n=45) received only chemotherapy exclude hormonotherapy, while 43.3% (n=74) of the metastatic stage patients received only chemotherapy exclude hormonotherapy. There was no correlation between the disease stage and chemotherapy for treatment (p=0.278). When the two age groups were examined, there was no difference between patients receiving chemotherapy (p=0.090).

Of the patients with early-stage disease who received disease-specific treatment was 53.7% (n=58), and the those who received only supportive care was 46.3% (n=50). Of the patients with metastatic disease who received disease-specific treatment was 59.6% (n=102), and the proportion

Table 1. The distribution of the primary diagnoses of the patients according to age and sex

	75-84 years n=229				≥ 85 years n=50			
	Male		Female		Male		Female	
	n	%	n	%	n	%	n	%
Lung cancer	28	20,10	10	11,10	2	8,30	0	0
Head and neck cancer	5	3,60	3	3,30	1	4,20	0	0
Primary brain tumor	3	2,20	2	2,20	0	0	1	3,80
Skin cancer	4	2,90	3	3,30	3	12,50	1	3,80
Gynecologic cancers	0	0	6	6,70	0	0	2	7,70
Colorectal carcinoma	10	7,20	8	8,90	2	8,30	4	15,40
Breast cancer	1	0,70	30	33,30	2	8,30	11	42,30
Bladder cancer	12	8,60	2	2,20	0	0	0	0
Gastric-esophageal cancer	11	7,90	9	10,00	1	4,20	3	11,50
Pancreatic cancer	2	1,40	5	5,60	1	4,20	2	7,70
Prostate cancer	51	36,70	0	0	11	45,80	0	0
Other type	12	8,50	12	13	1	4,20	2	7,60
Total	139	100	90	100	24	100	26	100

Table 2. The treatments that the patients received according to their stages and diagnoses

	Early stage			Metastatic stage		
	Disease specific treatment n (%)	Supportive treatment n (%)	Total n 100%	Disease specific treatment n (%)	Supportive treatment n(%)	Total n 100%
Lung cancer	6 (100%)	0 (0%)	6	20 (58,9%)	14 (41,1%)	34
Head & Neck cancer	2 (28,6%)	5 (71,4)	7	1 (50%)	1 (50%)	2
Primary Brain tumor	1 (25%)	3 (75%)	4	1 (50%)	1 (50%)	2
Skin cancer	1 (12,5%)	7 (87,5%)	8	1 (33,3%)	2 (66,7%)	3
Gynecologic cancers	0 (0%)	1 (100%)	1	6 (85,7%)	1 (14,3%)	7
Colorectal carcinoma	7 (87,5%)	1 (12,5%)	8	7 (43,8%)	9 (56,2%)	16
Breast cancer	18 (72,3%)	5 (21,7%)	23	13 (61,9%)	8 (38,1%)	21
Bladder cancer	2 (25%)	6 (75%)	8	2 (33,3%)	4 (66,7%)	6
Gastric-esophageal cancer	5 (45,4%)	6 (54,5%)	11	5 (38,5%)	8 (61,5%)	13
Pancreatic cancer	3 (75%)	1 (25%)	4	2 (33,3%)	4 (66,4%)	6
Prostate cancer	8 (40%)	12 (60%)	20	40 (95,2%)	2 (4,8%)	42
Other type	5 (62,5%)	3 (37,5%)	8	4 (21,1%)	15 (78,9%)	19
Total	58 (53,7%)	50 (46,3%)	108	102 (59,6%)	69 (40,4%)	171

of patients received supportive care was 40.4% (n=69). There was no correlation between stage and disease-specific treatment (p=0.328).

Disease-specific treatment rates and relationships were examined according to diagnosis and stage, regardless of age group. Among prostate cancer patients, 40% (n=8) received disease-specific treatment, while 60% (n=12) received only supportive care in the early stage, and 95.2% (n=40) received disease-specific treatment, while 4.8% (n=2) ($p<0.05$) received only supportive care in the metastatic stage. Among breast cancer patients, 78.3% (n=18) received disease-specific treatment, while 21.7% (n=5) received only supportive care in the early stage, and 61.9% (n=13) received disease-specific treatment, while 38.1% (n=8) (p=0.733) received only supportive care in the metastatic stage. Among lung cancer patients, 100% (n=6) received disease-specific treatment, while 0% (n=0) received supportive care only in the early stage, and 58.8% (n=20) received disease-specific treatment, while 41.2% (n = 14) (p = 0.051) received only supportive care in the metastatic stage. Among colorectal cancer patients 87.5% (n=7) received disease-specific treatment, while 12.5% (n=1) received only supportive care in the early stage, and 43.8% (n=7) received disease-specific treatment, while 56.3% (n=9) ($p<0.05$) received only supportive care in the metastatic stage. Among patients with gastroesophageal cancer, 45.5% (n=5) received disease-specific treatment, while 54.5% (n=6) received only supportive care in the early stage, and 38.5% (n=5) received disease-specific treatment, while 61.5% (n=8) (p=0.729) received only supportive care in the metastatic stage.

Discussion

Oncological treatments generally consist of expensive and complex treatments. The burden of cancer to society has increased dramatically with the aging of the population. Similar to other treatments for elderly patients, cancer treatment can become very complex. Comorbidities, polypharmacy, and the desire to maintain quality of life are important issues for the planning of treatments. These factors may even prevent patients from receiving cancer treatment. Apart from medical conditions, the patient's hesitation about receiving treatment also affects treatment decisions. Treatment decisions may also be affected by the physician's reluctance to treat certain groups of patients, as in younger patients.[4]

Breast cancer is the most common cancer in females, while prostate cancer is the most common cancer in males. Hormone therapy, which elderly individuals can easily tolerate, is an option for both types of cancer. Both types are also part of national cancer screening programs. Although the inclusion of patients over 70 years of age in screening programs is a controversial issue, the increase in treatment options seems to be very encouraging for diagnosis in these patients.

It is known that the cancer stages of elderly patients at the time of diagnosis are more advanced than in younger patients.[4] In our study, the rate of metastatic disease in the entire patient group was 61.3%, which was in agreement with those from previous reports.

In a questionnaire study by SB Yellen et al., elderly patients accepted treatment as much as younger patients.[5] In our study, 42.7% of the patients received supportive care. In

patients between the ages of 75 and 84, 40.2% received supportive care, while 54% of patients aged 85 years and older received supportive care. No statistically significant difference was found between the two age groups in terms of disease-specific treatment. In this case, we believe that age should not be used as a criterion in treatment decisions. We examined the five most common types of cancer in our study.

According to the United States Cancer Statistics published in 2020 by Siegel et al., prostate cancer ranks first among all cancer types in males with a prevalence of 21%. Although it is the most common cancer in men, deaths due to prostate cancer are up to one in six of all cases.[6] According to the health data of our country, prostate cancer is the second most common type of cancer in males over the age of 70.[7] Similarly, prostate cancer was the most common cancer in our study, ranking first in males aged >75 years. The slowness of the course of the disease allows the evaluation of follow-up treatment options with life expectancy calculations in the early stages. As life expectancy decreases in early-stage prostate cancer, the rate of recommendation for treatments such as chemotherapy or hormonotherapy decreases.

In our study, the rate of patients who were in the early stage and did not receive disease-specific treatment was 60% (n=12). Follow-up without treatment at an early stage is an important factor. Hormone therapy±chemotherapy are the medical treatment options that can be chosen for patients in the metastatic stage. Only 4.8% of patients in the metastatic stage received supportive care alone. Although the difference between them is statistically significant, differences in the treatment of early and metastatic prostate cancer cause this situation. Metastatic prostate cancer is associated with a lower rate of not receiving treatment compared to other cancers. The reason for this is that there are easily tolerated treatment options for elderly patients.

Breast cancer is the most common cancer in females of all age groups. There are many factors that determine the treatment of breast cancer, besides the disease stage. In addition to the personal characteristics of the patients, many variables such as tumor size, lymph node positivity, estrogen and progesterone receptor status of the tumor, human epidermal growth factor 2 (her2neu) expression, presence and location of metastases, and organ dysfunction due to metastases play a role in the choice of treatment. In the study conducted by Lavelle K et al., they stated that elderly breast cancer patients did not receive standard treatment like younger patients, which cannot be explained by tumor biology.[8] At the same time, patients in this age group have more estrogen and progesterone receptor positivity, but less her2neu positivity.[9] Tumor progression was also slower in these patients. Hormone receptor positivity is observed in 70%–80% of elderly breast cancer patients. Triple-negative breast cancer is observed in 15% of all patients.[10] It has been proven that adjuvant therapy in all age groups provides certain benefits for patients with breast cancer.[11] The choice of treatment for patients with metastatic disease is hormonotherapy or chemotherapy.

Hormonotherapy is a form of treatment that can be easily tolerated and applied to geriatric patients. Chemotherapy has toxic side effects for all patients. In metastatic disease, treatment is indicated for all breast cancer subtypes. In our study, 21.7% of patients with early-stage breast cancer did not receive disease-specific treatment, while 38.1% did not receive disease-specific treatment in the metastatic stage, and there was no correlation between receiving disease-specific treatment and tumor stage in these patients (p=0.733). Although hormonotherapy may be chosen, it is important to note that 40% of patients did not receive treatment. Personal characteristics such as comorbidities and the type of treatment restricted a more patient-centered approach from being utilized in these patients, regardless of the stage.

Hormone treatment can only be recommended for patients with breast and prostate cancers. While hormone therapy can be recommended for all patients with metastatic prostate cancer, hormone therapy is recommended for patients with metastatic breast cancer who only show hormone receptor expression. Due to differences in the treatment for these two diseases, the group that cannot receive treatment for breast cancer is higher. The reason for the high rate of not receiving treatment in breast cancer compared to prostate cancer is that there is a group in which hormonotherapy cannot be administered.

Lung cancer is the second most common cancer in both males and females of all ages in the United States. However, it ranks first among cancer-related deaths.[6] In the Lace collaborative group study, platinum-based chemotherapy was shown to improve outcomes in postoperative non-small cell lung cancer.[12] In metastatic disease, cancer treatment is recommended for all suitable patients according to the histological and molecular characteristics of the disease. Chemotherapy is recommended for both the limited and metastatic stages of small cell lung cancer. In our study, lung cancer was the second most common type of cancer between the ages of 75 and 84 years, regardless of sex. All patients in the early stages received a disease-specific treatment. We believe that the fact that all patients received treatment in the early stage depended on their suitability in the early stage. Of the patients in the metastatic stage, 41.2% (n=14) received

only supportive care. When the early and metastatic stages were compared, the difference between the rates of treatment was not statistically significant but was very close to the limit of significance (p=0.051). Approximately half of the patients in the metastatic stage were unable to receive disease-specific treatment. The clinical situation of metastatic lung cancer greatly reduces the physical performance of patients. We think that such a low rate of receiving treatment in metastatic patients is due to low patient performance and a low expectation of response to treatment, apart from geriatric factors.

Although colorectal cancer can be seen at any age, it is more common in the elderly. It is the third most common type of cancer in both males and females in the United States.[6] In patients over 65 years of age, these chemotherapy regimens have a survival advantage similar to younger patients. [13] Eight patients had early-stage CRC and 16 patients had metastatic stage CRC. While the majority of early-stage patients received disease-specific treatment (87.5%, n=7), the majority of metastatic stage patients received supportive care (56.3%, n=9). The rate of receiving disease-specific medical treatment in patients with colorectal carcinoma was found to be related to the disease stage (p=0.040). In elderly patients with metastatic colorectal carcinoma, the disease makes the patient frailer and ineligible for treatment.

According to cancer statistics from Turkey, stomach cancer in patients over 70 years of age is among the top five types of cancer that is most common in both males and females. [7] Gastric and esophageal junction cancers have been evaluated together. Although adenocarcinoma and squamous cell cancer subtypes are found in gastroesophageal cancer, the distinction of these subtypes in terms of survival or response to treatment remains unclear.[14] Various meta-analyses have shown that chemotherapy provides better outcomes compared to supportive care.[15] In our study, 54.5% (n=6) were patients with gastroesophageal cancer who receive supportive care in the early stages, while 61.5% (n=8) could receive supportive care at the metastatic stage. Receiving treatment was not related to stage (p=0.729). In these patients, the rate of not receiving disease-specific treatment was high in all stages. This can be explained by the fact that the disease makes patients frailer, regardless of the stage.

Conclusion

Metastatic disease is more common in elderly patients than those in early-stage disease. Disease-specific treatments can be performed more easily in patients with common cancer types, such as breast and prostate cancers. Lung, gastroesophageal, and colorectal carcinomas make the patient frailer, resulting in more complex and sometimes even unfeasible treatments. Gastroesophageal cancers were found to make treatment more difficult in patients over the age of 75 years at all stages. Age alone should not be used as a criterion when choosing medical treatment for patients over 75 years of age. The tissue from which the cancer originated directs the treatments.

Disclosures

Ethics Committee Approval: This study was approved by the Harran University clinical research ethics committee with the ethical committee decision numbered HRU/21.05.14.

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References

1. Ries LAG, Eisner MP, Kosary CL et al. SEER Cancer Statistics Review, 1975-2000, National Cancer Institute. Bethesda, MD. [Internet] Available from (https://seer.cancer.gov/archive/csr/1975_2000/) Accessed: 15.04.2021.
2. Noone AM, Howlader N, Krapcho M et al. SEER Cancer Statistics Review, 1975-2015, National Cancer Institute. Bethesda, MD. [Internet] Available from (https://seer.cancer.gov/csr/1975_2015/) Accessed: 15.04.2021.
3. Yee KW, Pater JL, Pho L et al. Enrollment of older patients in cancer treatment trials in Canada: why is age a barrier? J Clin Oncol 2003; 21:1618. PMID: 12697888;
https://doi.org/10.1200/jco.2003.12.044
4. McKenna, R.J. (1994), Clinical aspects of cancer in the elderly. Treatment decisions, treatment choices, and follow-up. Cancer, 74: 2107-2117. PMID:8087778; https://doi.org/10.1002/1097-0142(19941001)74:7+%3C2107::AID-CNCR2820741719%3E3.0.CO;2-1
5. Yellen SB, Cella DF, Leslie WT. Age and clinical decision making in oncology patients. J Natl Cancer Inst. 1994 Dec 7;86(23):1766-70. PMID: 7966414; https://doi.org/10.1093/jnci/86.23.1766
6. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2020. CA Cancer J Clin. 2020 Jan;70(1):7-30. doi: 10.3322/caac.21590. Epub 2020 Jan 8. PMID: 31912902; https://doi.org/10.3322/caac.21590
7. Türkiye halk sağlığı genel müdürlüğü [Internet] Available from (https://hsgm.saglik.gov.tr/tr/kanser-istatistikleri/yillar/2016-yili-turkiye-kanser-i-statistikleri.html) Accessed: 20.04.2021.
8. Lavelle K, Todd C, Moran A et al. Non-standard management of breast cancer increases with age in the UK: a population

based cohort of women > or =65 years. Br J Cancer. 2007 Apr 23;96(8):1197-203. PMID: 17387342; https://doi.org/10.1038/sj.bjc.6603709

9. Jenkins EO, Deal AM, Anders CK et al. Age-specific changes in intrinsic breast cancer subtypes: a focus on older women. Oncologist. 2014 Oct;19(10):1076-83. PMID: 25142841; https://doi.org/10.1634/theoncologist.2014-0184
10. Muss HB. Coming of age: breast cancer in seniors. Oncologist. 2010;15 Suppl 5:57-65. PMID: 21138956; https://doi.org/10.1634/theoncologist.2010-s5-57
11. Tamirisa N, Lin H, Shen Y et al. Association of Chemotherapy With Survival in Elderly Patients With Multiple Comorbidities and Estrogen Receptor–Positive, Node-Positive Breast Cancer. JAMA Oncol. 2020;6(10):1548–1554. PMID: 32672820; https://doi.org/10.1001/jamaoncol.2020.2388
12. Pignon JP, Tribodet H, Scagliotti GV et al. LACE Collaborative Group. Lung adjuvant cisplatin evaluation: a pooled analysis by the LACE Collaborative Group. J Clin Oncol. 2008 Jul 20;26(21):3552-9. PMID: 18506026; https://doi.org/10.1200/jco.2007.13.9030
13. Sundararajan V, Mitra N, Jacobson JS et al. Survival associated with 5-fluorouracil-based adjuvant chemotherapy among elderly patients with node-positive colon cancer. Ann Intern Med. 2002 Mar 5;136(5):349-57. PMID: 11874307; https://doi.org/10.7326/0003-4819-136-5-200203050-00007
14. Webb A, Cunningham D, Scarffe JH et al. Randomized trial comparing epirubicin, cisplatin, and fluorouracil versus fluorouracil, doxorubicin, and methotrexate in advanced esophagogastric cancer. J Clin Oncol. 1997 Jan;15(1):261-7. PMID: 8996151; https://doi.org/10.1200/jco.1997.15.1.261
15. Janmaat VT, Steyerberg EW, van der Gaast A et al. Palliative chemotherapy and targeted therapies for esophageal and gastroesophageal junction cancer. Cochrane Database Syst Rev. 2017 Nov 28;11(11):CD004063. PMID: 29182797; https://doi.org/10.1002/14651858.cd004063.pub4