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Local management of metastatic breast cancer will improve the overall survival: Meta analysis study

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ABSTRACT

Background: One of the most common types of cancer is Breast Cancer (BC). this meta-analysis study with the aim of Local Management of metastatic Breast Cancer will improve the overall survival.

Methods: In this meta-analysis study based on PARISMA checklist and PICO criteria, the survival rate was compared in two methods Systemic Therapy (ST) and Local Therapy (LT) in cancer patients. CMA software and random statistical tests were used to analyze the data.

Result: Result showed, 232 articles were found in the initial search, and finally 4 articles entered the meta-analysis stage. The studies conducted in two countries, USA and China, were published in the years 2017 to 2021. In the systemic therapy method, the survival rate varied from 22% to 49%, and in the local therapy method, from 43.56 to 52%. Overall Survival in ST methods was 31.8 (95% CI, 21.5 - 44.1) and Overall Survival in LT methods was 47.1 (95% CI, 41.0-53.3).

Conclusion: Considering that the survival rate is higher in LT methods, therefore, this method is recommended for BC patients.

Keywords: breast cancer, systematic review, meta-analysis, overall survival

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INTRODUCTION

Due to the advancement of technology and various medical treatments, for this reason, the prevalence of chronic diseases is increasing day by day, and these diseases lead to the creation of a large care and economic burden on the patient, the patient's family, and the healthcare system [1-3]. Cancer is one of the different types of chronic diseases, the incidence of which is increasing. So that cancer is the deadliest disease that threatens human life and has irreparable side effects, including physical side effects and psychological side effects for the patient [4-8]. One of the most common types of cancer is Breast Cancer (BC)[9].

In recent years, the increase in breast cancer has placed it among the most malignant diseases among Iranian women [9]. Preventive behaviors and screening play an important and decisive role in minimizing the amount of BC in patients. However, despite efforts to prevent new cases of this disease, its prevalence is reported to be high. So that in 2020, breast cancer is reported as a common cancer in women with the rate of 2.26 million people [10].

In fact, BC is one of the most common types of cancer that has increased in all countries, including developed and developing countries. Also, in Iran, the growth trend of cancer has increased from 15.96 to 40.72 per hundred thousand people over a 15-year period [11-13]. On the other hand, in addition to the BC rate, one of the problems related to these patients is the high mortality rate. So that BC caused the death of 684,996 patients, which accounted for 63% of all deaths in African and Asian countries [9, 13].

Patients with BC may experience complications including disease metastasis to other parts of the body. BC metastasis is one of the important complications of the disease, which leads to treatment failure and decreases the survival rate of patients. For this reason, identifying the rate and factors affecting metastasis is very important in understanding the disease and its treatment. Common organs of metastasis include bone, lung, liver, regional lymph nodes, and brain [14-16].

Performing treatment measures for BC is influenced by various factors, including the patient's clinical condition. Among the types of treatments performed, we can refer to various methods such as radiotherapy, chemotherapy and surgery. Radiotherapy in BC causes local control of the disease and also increases the survival of patients. Another type of method is radical mastectomy surgery, which includes complete removal of the

affected breast along with its skin, muscles and axillary lymph nodes [17-19].

On the other hand, the progress made in the treatment of various types of cancer, especially BC, has increased the survival rate of these patients compared to recent years [17]. In fact, in this disease, patient survival is accepted as the main criterion for patient control and measuring the effect of treatment. The survival rate of these patients is affected by factors such as receiving different types of treatment (including surgery, chemotherapy, radiotherapy), body mass index, type of tumor pathology, tumor grade, the age of the patient before menopause, as well as the social and economic status of the patient [20-22].

AIM

Considering the high prevalence of breast cancer in the world and the need to identify effective factors on the treatment of this type of cancer, meta-analysis study was conducted with the aim of Local Management of metastatic Breast Cancer will improve the overall survival**.**

METHODS

This study was conducted according to PARISMA checklist and according to the following procedure [23].

PICO criterion includes

- P: BC will improve the overall Survival
- I: overall Survival
- C: Mortality in various BCS
- O: Comparison of the effect of ST and LT on the survival rate

Paper selection and data extraction

The search was done in all international databases, including Scopus, PubMed and ISI, as well as the Google Scholar search engine. Search keywords included breast cancer, metastasis, prevalence, incidence, survival rate, mortality, treatment, chemotherapy, mastectomy and surgery.

Inclusion and exclusion criteria

All English articles with full files that matched the keywords of the study were extracted.

Data extraction

To extract data from the checklist including the year of publication of the article, author's name, Type of study, Country, OMBC, Sample size, Duration (months) and Overall survival (%).

Statistical analysis

CMA software and random statistical tests were used to analyze the data.

RESULTS

According to figure 1, 232 articles were found in the initial search, and finally 4 articles entered the meta-analysis stage. The studies conducted in 2 countries, USA and China, were published in the years 2017 to 2021. In the systemic therapy method, the survival rate varied from 22% to 49%, and in the local therapy method, from 43.56 to 52% (Figure 2-5). Overall Survival in ST methods was 31.8 (95% CI, 21.5 - 44.1) and Overall Survival in LT methods was 47.1 (95% CI, 41.0 - 53.3) (Table 1).

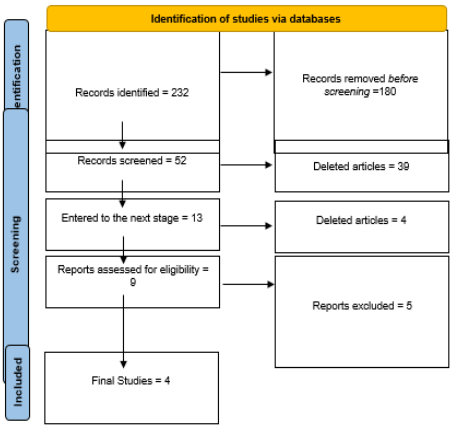

Fig. 1. Flowcharts for systematic review

Tab. 1. Specifications of the articles included in the study

	Author	Year	Type of Study	Country	OMBC	Sample Size		Duration (months)	Overall Survival (%)	
						ST	LT		ST	LT
1	Tan et al [24]	2016	Retrospective	China	Breast	5735	4706	29	22	43.56
2	Whitney et al [25]	2017	Retrospective	USA	Breast	13505	10510	37.5	36.8	52
3	Xie et al [26]	2017	Retrospective	China	Breast	46	177	21.3	22.13	45.6
4	Khan et al [27]	2021	Retrospective	USA	Breast	131	125	53.1	47.9	46.7

*ST: systemic therapy
*LT: local therapy

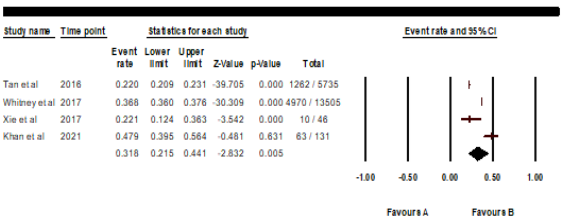

Fig. 2. The survival rate of breast cancer patients in the systemic therapy method

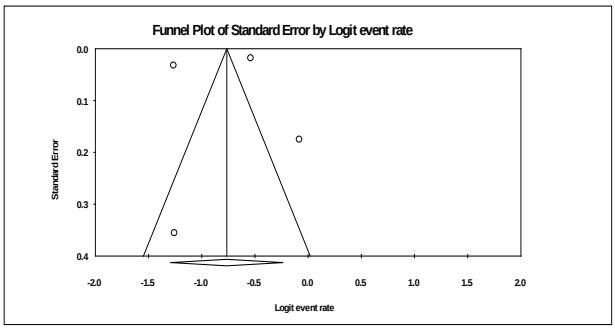

Fig. 3. Funnel plot for systemic therapy

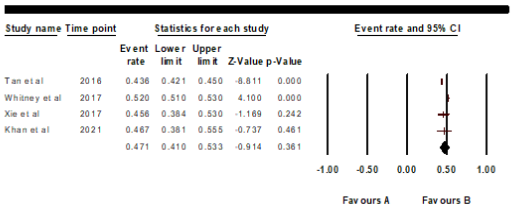

Fig. 4. - The survival rate of breast cancer patients in the local therapy method

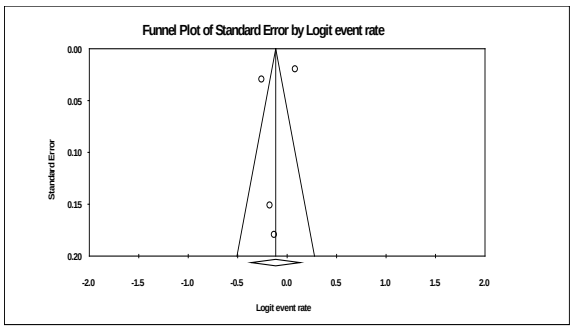

Fig. 5. Funnel plot for local therapy

DISCUSSION

The prevalence of complications of chronic diseases is increasing, and for this reason, the survival rate in these patients is low and the mortality rate is high [28-30]. BC is one of the types of chronic diseases that after cancer diagnosis, the patient is known as a cancer survivor. In fact, it is essential that diagnostic and therapeutic measures are performed for the patient to prevent the recurrence of the disease. On the other hand, the existing treatments in the management of BC patients are not definitively applicable and in many cases the patient dies [31, 32]. this study was conducted with the aim of determining the survival rate of cancer patients who were treated with ST and LT methods.

Result showed, overall Survival in ST methods was 31.8 (95% CI, 21.5 - 44.1) and Overall Survival in LT methods was 47.1 (95% CI, 41.0 - 53.3). In the field of survival rate in patients with BC, various original studies and meta-analysis have been done all over the world with different methodological methods. In this regard, the findings of studies conducted around the world are compared with the results of this study.

In the study of Kamel et al., in the field of analysis of factors affecting the survival of patients with BC, it was showed that the probability of survival of patients in the fifth year is 85% and in the tenth year is 72%. In fact, according to these findings, the probability of death after treatment of patients is less reported and various variables such as age, disease stage, hormone therapy, type of surgery and chemotherapy have influenced the survival rate of patients [33]. In Mohammadpour et al.'s study, the 5-year survival rate of patients was equal to 60.6%, and the patient's emergency hospitalization status (time to see a doctor) and the patient's economic status are known as two factors affecting the survival rate [34]. The survival rate in the conducted studies is higher than the results of this meta-analysis study, which is due to the difference in the method of conducting the conducted studies.

In meta-analysis studies, it showed that the survival rate of BC patients in Iran with a sample size of 999335 from 52 articles found is 68.84% of the report, in the study of Maajani et al., found in 130 articles, the 1-year survival rate is 92%, 2-year survival equal to 75%, 5-year survival equal to 73% and survival over 10 years equal to 61% were reported [35, 36]. which shows the effect of BC disease on the survival rate of patients. It is consistent with the results of this study that the survival rate is 31.8% and the survival rate is 47.1%.

In relation to the relationship between the type of BC treatment and the survival rate, this study showed that the survival rate was 31.8% in ST methods and 47.1% in LT methods. In the meta-analysis study of Headon et al., surgical treatment had reduced the mortality of patients by 37% [37] . In the meta-analysis study by Raphael et al., if the duration of the onset of symptoms until surgery was reduced, the survival rate of patients was increased. In fact, avoiding delay in treatment improved the survival status of patients [38]. In fact, if treatment measures such as surgery, ST methods and LT methods are performed for patients, it is effective in improving the survival rate of patients.

CONCLUSION

Considering that the survival rate is higher in LT methods, therefore, this method is recommended for BC patients**.**

CONFLICT OF INTEREST

None

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