The Effects of Different Endocrine Therapies on the Survival of Breast Cancer Patients

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Purpose

The goal of endocrine therapy is to reduce the risk of breast cancer recurrence and mortality. Among different endocrine therapies, tamoxifen is suitable for pre- and post-menopausal women, whereas aromatase inhibitors (AIs), such as anastrozole, letrozole, and exemestane can be administered to post-menopausal women. Owing to the large price difference between these two types of medications, this study aims to investigate their effects on breast cancer patient survival.

Materials and Methods

This retrospective cohort study is based on data from the National Health Insurance Research Database (NHIRD) between 2000 and 2013. The study examined 1002 breast cancer patients newly diagnosed between 2000 and 2005 as research subjects, and conducted follow-up until 2013. In order to exclude mortality due to severe illness instead of different medication, this study set new breast cancer patients who passed away within 180 days and patients with other cancer diagnosis records 2 years prior to breast cancer diagnosis as criteria for exclusion to mitigate the issue of bias. By doing so, this study examined the effects of different endocrine therapy medications, ages of breast cancer onset, and the Charlson Comorbidity Index (CCI) on patient survival.

Results

Among these subjects, 51 used AIs, 561 used tamoxifen, and 390 alternated between the use of tamoxifen and AIs. The mean follow-up period in this study was 9.63 years, and the mean duration of taking endocrine medication was 4.04 years. The tamoxifen group had the longest follow-up period (9.87 years), shortest endocrine therapy duration (3.29 years), and best survival rate (86.1%).

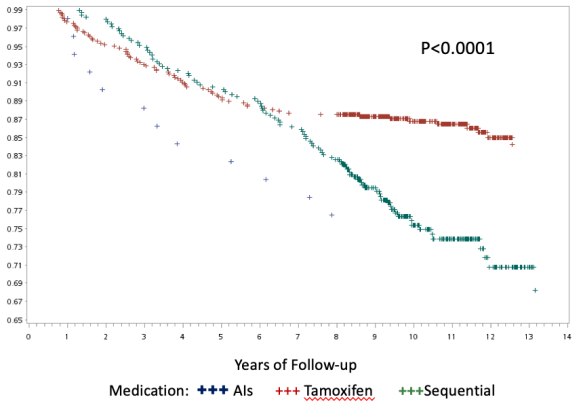
For patients taking tamoxifen, the incidence density of death was 14.08 for 1,000 persons per year. The respective incidence density (for 1,000 persons per year) for patients taking AIs and in the Switches group were 1.94 and 1.88 times higher than that of patients taking tamoxifen.

In regard to the types of endocrine therapy, the Cox proportional hazards multiple regression model showed the respective mortality rate of the AIs and Switches groups to be 1.92 times (p=0.0363) and 1.86 times (p=0.0001) greater than the tamoxifen group. The above findings had reached statistical significance levels. In terms of age, the mortality rate of patients over the age of 55 was 1.8 times higher than the mortality rate of patients under the age of 50 (p=0.0003). On the CCI level, the mortality rate of patients with a CCI score above 3 was 4.17 times higher than that of patients with a CCI score of zero (p<.0001).

Cox regression analysis on factors that affected breast cancer patients survival (n=1002).

Variables	Model 1[a] HR[c]	95%CI	p	Model 2[b] AHR[c]	95%CI	p
Endocrine therapy						
3 (Tamoxifen)	1.00			1.00		
2 (AIs)	1.92	1.04-3.52	0.0363*	2.07	1.11-3.86	0.0227*
4 (Sequential)	1.86	1.38-2.51	<.0001***	3.14	2.28-4.31	<.0001***
Age						
<50y	1.00			1.00		
50-55y	1.12	0.75-1.69	0.5791	1.23	0.81-1.87	0.3390
>55y	1.80	1.31-2.47	0.0003***	1.67	1.19-2.33	0.0027**
Low-income family						
Yes	1.00			1.00		
No	1.87	0.26-13.36	0.5317	2.78	0.39-20.05	0.3100
CCI type						
Score 0	1.00			1.00		
Score 1-2	1.28	0.91-1.80	0.1543	1.13	0.79-1.62	0.4902
Score ≧3	4.17	2.31-7.53	<.0001***	4.47	2.40-8.32	<.0001***

Kaplan-Meier survival curve



Conclusion

A higher survival rate was observed for patients who chose to use tamoxifen for endocrine therapy, had an age of breast cancer onset younger than 50 years old, with no comorbid conditions.