Treatment Intensity and Survival in Older Adults with Breast Cancer: Undertreatment or Overtreatment

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Background

Older adults with breast cancer are under-represented in clinical trials despite the increasing aging population and extended life expectancy. Concerns about comorbidities and treatment-related toxicities lead to undertreatment. It remains unclear whether reduced treatment intensity leads to inferior survival outcomes, or whether intensive treatment in frail individuals contributes to harm. This study aimed to investigate real-world treatment patterns and their association with survival outcomes in older breast cancer patients.

Methods and Materials

We retrospectively reviewed patients aged ≥65 years who underwent surgery for breast cancer at Inha University Hospital between January 2007 and December 2019. Clinical characteristics, treatment modalities (chemotherapy, radiotherapy, endocrine therapy, and anti-HER2 therapy), and treatment completion rates were collected. Overall survival (OS) was defined as the interval from the date of surgery to the last follow-up, and disease-free survival (DFS) as the interval from the date of surgery to any recurrence. Statistical analyses were performed using SPSS (IBM Corp.), and graphs were generated using Microsoft Excel (Microsoft Corp.).

Results

A total of 319 patients were included (mean age, 71 years). Hypertension was present in 59% of patients, and 6% had a previous or concurrent history of other malignancies. Overall, 21% of patients had no comorbidities requiring medication. Treatment completion rates varied, with dropout rates of 29% for anti-HER2 therapy, 26% for endocrine therapy, and 17% for chemotherapy.

Table 1. Baseline patient characteristics

Characteristics	Patients(%)
Age (mean ± SD)	70.9 ± 5.1
BMI (mean ± SD)	26.1 ± 4.6
Comorbidity	
Hypertension	188(59)
Diabetes Mellitus	74(23)
Cerebrovascular disease	16(5)
Myocardial infarction	10(3)
Demetia	5(2)
Other malignancies	20(6)
No comorbidities	67(21)

Table 2. Pathologic parameters of patients

Parameters		Patients(%)
Pathologic Stage	Tis	42(13)
	T1	156(49)
	T2	103(32)
	T3	7(2)
	T4	9(3)
	N0	221(71)
	N1	59(19)
	N2	20(6)
	N3	12(4)
Hormone receptor	Positive	242(79)
	Negative	75(24)
HER2	Positive	67(71)
	Negative	227(71)
	Unknown	25
Ki67 index	<20%	159(51)
	≥20%	154(49)

HER2 Positive (3+,2+ and SISH+), Negative (0,1+,2+ and SISH-), Unknown (2+ and SISH not done)

Table 3. Treatment modalities

Treatment		Patients(%)
Neoadjuvant chemotherapy		12(4)
Surgery	Total mastectomy	160(50)
	BCS	159(50)
	ALND	87(27)
	SLNB	224(70)
	No axillary staging	8(3)
Adjuvant	Chemotherapy	122(38)
	Endocrine therapy	238(75)
	Radiotherapy	146(46)
	Anti-HER2 therapy	28(9)

Figure 1. Completion rate of adjuvant treatment

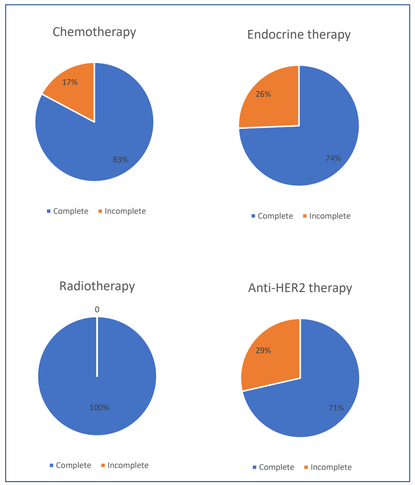


Figure 2. Distribution of Patients by Age

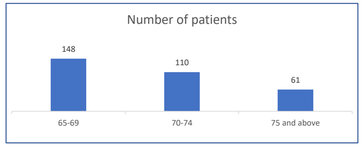
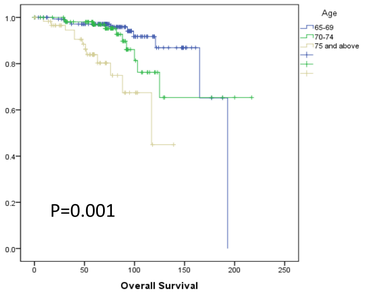


Figure 3. OS and DFS across age groups



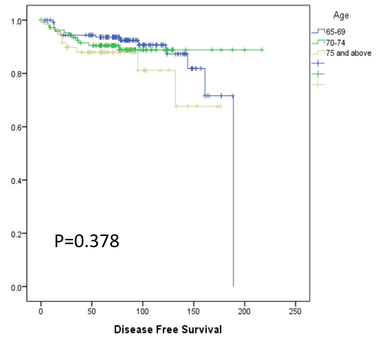


Table 4. Univariate Cox analysis for OS and DFS

	Factor	HR (95% CI)	*p*-value
OS	Chemotherapy discontinuation	3.103(0.610-15.773)	0.172
	Endocrine therapy discontinuation	6.960(2.881-16.814)	<0.001
DFS	Chemotherapy discontinuation	4.023(1.61-10.053)	0.003
	Endocrine therapy discontinuation	9.496(3.59-25.118)	<0.001

In the multivariate analysis adjusting for age, body mass index, stage, hormone receptor status, HER2 status, and Ki-67 proliferation index, older age (≥75 years) remained independently associated with worse overall survival (HR 5.25, 95% CI 2.07–13.29; p < 0.001). In univariate Cox models, discontinuation of endocrine therapy was associated with an increased risk of both overall survival and disease-free survival. Discontinuation of chemotherapy was associated with a higher risk of disease-free survival but was not significantly associated with overall survival.

Conclusions

While older age was independently associated with worse OS, DFS did not differ significantly by age, indicating that mortality in older patients is more attributable to non-breast cancer causes, and that appropriately treated older adults can achieve comparable recurrence outcomes. These findings highlight the need for individualized treatment decisions based on functional status rather than chronological age, particularly to avoid undertreatment in fit older adults.

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