

10-year survival analysis of breast cancer patients: Data from Hong Kong Breast Cancer Registry

Editor's message

This issue intends to complement the “Hong Kong Breast Cancer Registry Report No. 14” on the study of breast cancer survival. Our findings suggested that cancer stage, age and biological subtype would affect the survival of breast cancer patients. Our study aims to expand our knowledge of breast cancer survival in Hong Kong and provide doctors with local data for sharing with their patients.

Introduction

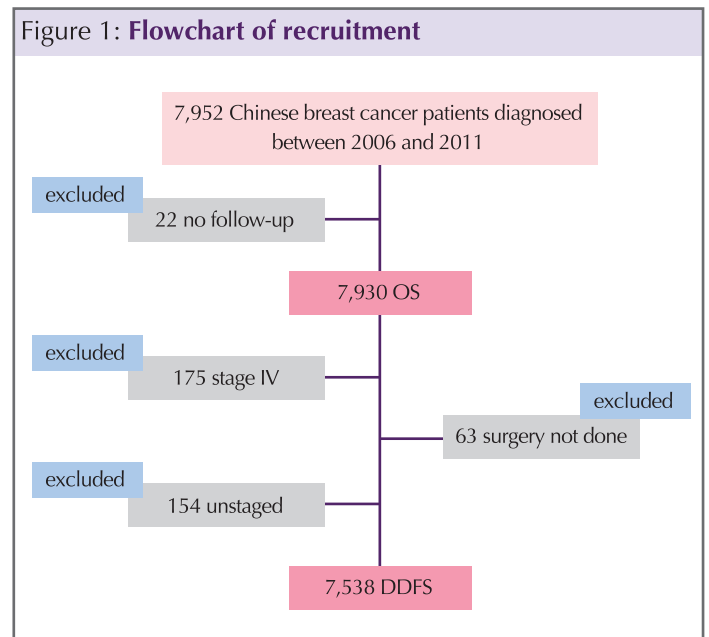
Survival is a key concern for breast cancer patients and their families. Staging, age and biological subtypes have all played a part. Advanced stage breast cancer has consistently been associated with lower survival rate.¹⁻³ While elderly patients would have poorer survival,⁴ younger patients, especially those who aged 40 or below, were also found to have poorer prognosis.^{4,5} In addition, patients with luminal A subtype tended to present better survival than patients with other subtypes.⁶⁻⁹ Since the American Joint Committee on Cancer (AJCC) have updated the staging system by taking tumour grade, biomarkers expression and genomic assays into account,¹⁰ it is important to expand our knowledge of breast cancer survival in Hong Kong with consideration of clinicopathologic features and biological subtypes.

Cancer survival is, no doubt, a hot topic in breast cancer research, but limited work has been done in Hong Kong. More importantly, the paper on breast cancer survival in Hong Kong had been based on historical patients who were diagnosed in an earlier era between 1997 and 2001.¹¹ Since substantial advances in medical technologies and novel therapies for breast cancer have been introduced in Hong Kong, the more recent database of the Hong Kong Breast Cancer Registry (HKBCR) allows a better understanding of breast cancer survival in the local context. Taking into consideration that many survival studies have only focused on the initial period of 5-year post-diagnosis,^{1,12,13} it is also valuable to fill the knowledge gap on a longer survival time. Therefore, this study aimed to investigate the 10-year survival of Chinese breast cancer patients in Hong Kong. These findings would hence provide doctors with local data to share with their patients and better estimate their prognosis.

Methods

This was a retrospective study based on data collected through the HKBCR. Records on 7,952 Chinese women who were diagnosed with breast cancer between 2006 and 2011 were retrieved. Twenty-two patients who could not be followed up were excluded from the study. Hence, data of 7,930 patients were used to examine the 10-year overall survival (OS). To further study the 10-year distant-disease-free survival (DDFS), 7,538 patients with stages 0-III disease and who received breast surgery were included in the analyses (see Figure 1).

Figure 1: Flowchart of recruitment



OS: overall survival; DDFS: distant-disease-free survival

Descriptive statistics was employed to describe the patient and cancer characteristics. OS refers to the time interval between cancer diagnosis and death from any cause. DDFS refers to the time interval between date of first treatment and date of event (i.e. distant recurrence or death from breast cancer). OS and DDFS were estimated by the Kaplan-Meier method, and log-rank tests were used to compare the survival curves among different groups. A p-value of less than 0.05 was considered statistically significant, while Bonferroni adjustment was applied to correct for multiple comparisons.

Results and Discussion

In total, 7,930 patients were included in the study, which covered 42.5% of the cases in Hong Kong Cancer Registry during the same period of time (18,678 cases). Among them, 62.3% had been followed up for 10 years or more and the median follow-up period was 127 months. Unlike the previously reported survival study on breast cancer,¹¹ the current study was the first Hong Kong study to examine the 10-year survival of breast cancer in Hong Kong.

Characteristics of the patients were tabulated in Table 1. The median age at diagnosis was 50.6 (range: 21.3-101.4). Of the patients, 38.1% had stage II disease and 64.0% were diagnosed with HR+ HER2- cancer.

Table 1: Characteristics of breast cancer patients (N=7,930)

	Number	%
Age group		
≤40	995	12.7
41-50	3,072	39.2
51-60	2,349	29.9
61-70	986	12.6
>70	443	5.6
Not known	85	—
Cancer stage		
Stage 0	952	12.0
Stage I	2,460	31.0
Stage II	3,020	38.1
Stage III	1,120	14.1
Stage IV	175	2.2
Unstaged	203	2.6
Biological subtype		
HR+ HER2-	4,614	64.0
HR+ HER2+	1,110	15.4
HR- HER2+	700	9.7
TNBC	789	10.9
Not known	717	—

HR: hormone receptor; TNBC: triple negative breast cancer

A. Overall survival

Figure 2 shows the OS of breast cancer patients included in the current study. The OS at 10 years was 87.7%. Patients with advanced stage disease showed poorer OS than those with early stage disease ($p<0.005$). The 10-year OS for stage 0, I, II, III and

IV were 97.1%, 94.3%, 90.2%, 74.0% and 26.4% respectively. The findings indicated that the 10-year OS of breast cancer patients in Hong Kong were comparable to and sometimes even better than some Asian countries/regions, such as Taiwan,¹⁴ South Korea¹⁵ and Japan.¹⁶

Patients aged above 70 showed poorer OS than those in other age groups ($p<0.005$). With increasing age, the proportion of death from unrelated cause, e.g. comorbidities, was 59.7% among patients of age above 70, while 7.4% among patients of age 40 or below (Table 2). This may explain the poorer survival of patients with older age.

Survival distribution for aged 41-50 also differed from that for aged 51-60 and aged 61-70 ($p<0.005$). Patients who aged 41-50 had better OS than the older age groups.

In addition, survival distribution for HR+ HER2- was significantly better than that for TNBC ($p<0.008$). Patients with HR+ HER2- subtype had better OS, which was consistent with the current literatures.^{6,7,9,17}

B. Distant-disease-free survival

Figure 3 shows the DDFS of breast cancer patients studied. Among stages 0-III patients who received surgery, the DDFS at 10 years was 90.3%. As expected, patients with advanced stage disease showed poorer DDFS than those with early stage disease ($p<0.008$). The 10-year DDFS for stage 0, I, II and III were 98.2%, 95.6%, 90.1% and 72.6% respectively.

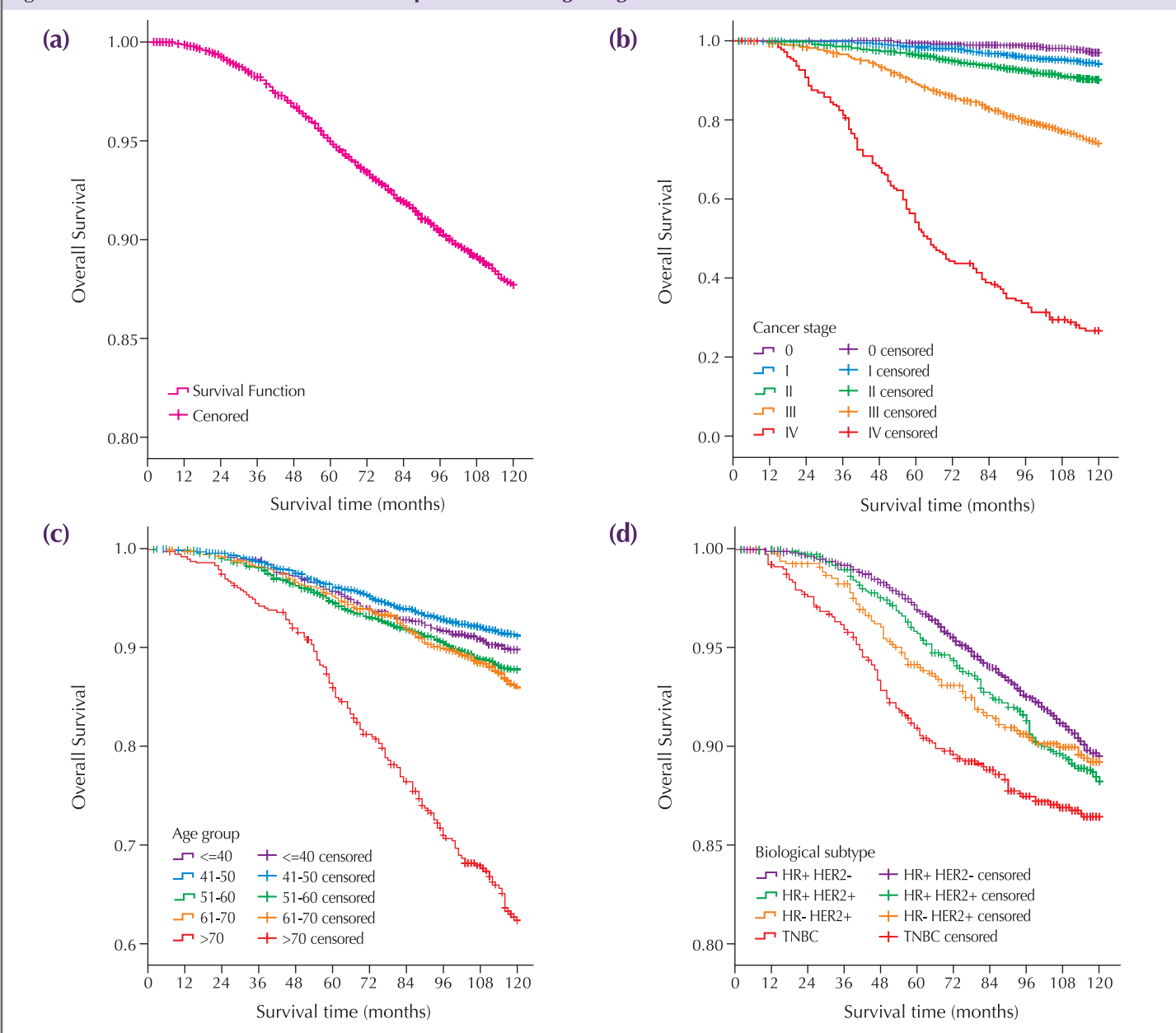
It was noteworthy that patients aged below 40 showed poorer DDFS than those aged 41-50 ($p<0.005$). Current literatures indicated that younger patients tended to have more aggressive disease, e.g. higher tumour grade.^{18,19} In this study, patients aged below 40 with invasive disease had a higher proportion of grade 3 tumours than those aged 41-50 (41.8% vs 37.2%), which might help explain the poorer DDFS.

However, no significant differences in survival distributions were found among biological subtypes. When investigating the pattern of distant recurrence site by biological subtype, the data revealed that patients with HR+ disease had more bone metastasis but less brain metastasis, while patients with TNBC disease had more lung metastasis (Table 3). In addition, the median time to distant recurrence was 1-2 years later for patients with HR+ disease than those with HR- disease (Table 3). These findings echoed the findings reported from the studies conducted in Western and Asian countries.²⁰⁻²²

Table 2: Cause of death (N=898)

	Age group									
	≤40		41-50		51-60		61-70		>70	
	N	%	N	%	N	%	N	%	N	%
Breast cancer	86	91.5	213	84.2	200	73.8	72	57.1	62	40.3
Unrelated cause	7	7.4	40	15.8	71	26.2	54	42.9	92	59.7
Cause not known	1	1.1	0	0.0	0	0.0	0	0.0	0	0.0

Figure 2: Overall survival of breast cancer patients in Hong Kong



Note: (a) all cases (N=7,925), (b) by cancer stage (N=7,722), (c) by age group (N=7,840) and (d) by biological subtype (N=7,208)

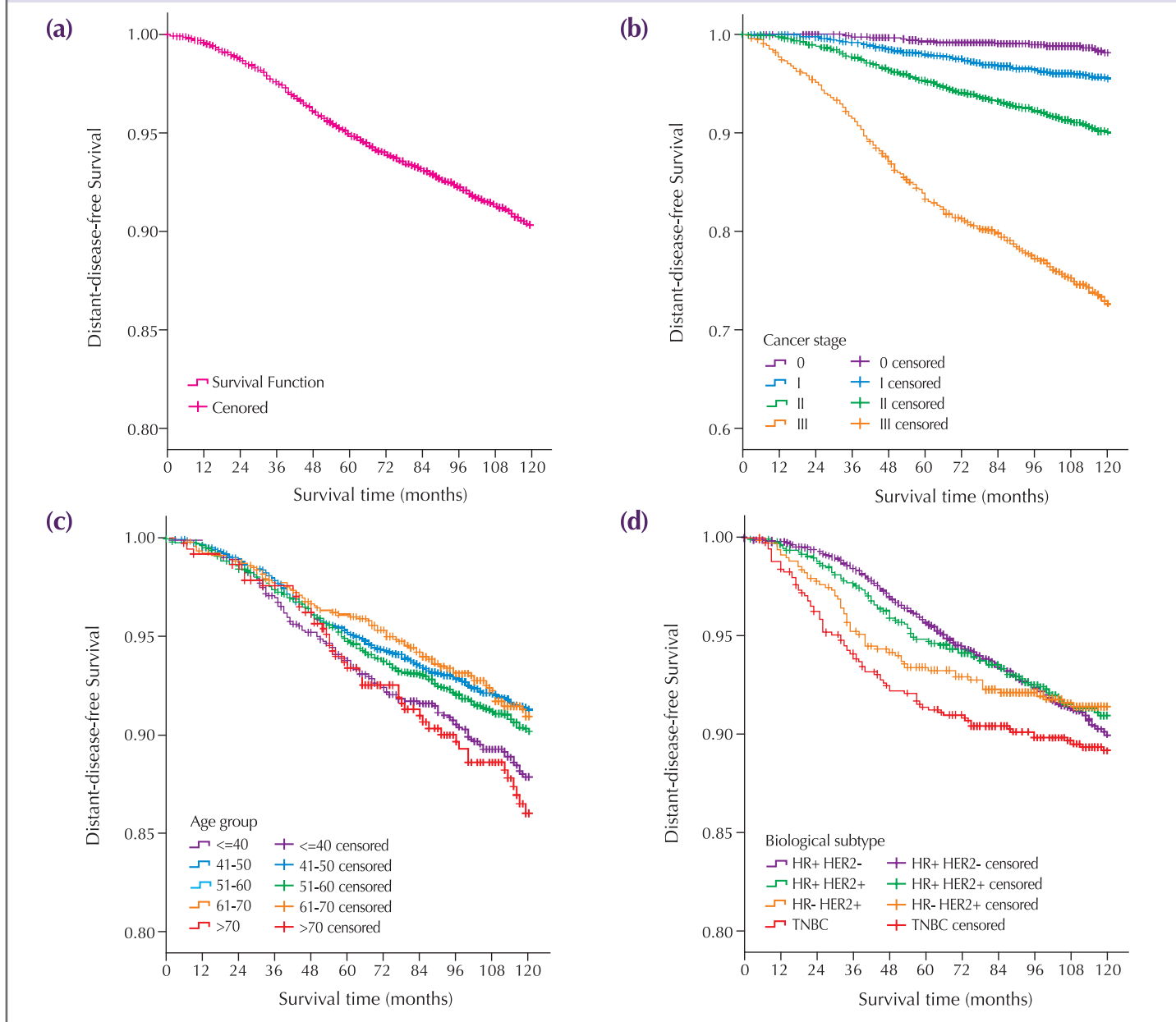
Table 3: Distant recurrence site by biological subtype (N=557)

	Biological subtype							
	HR+ HER2- (N=361)		HR+ HER2+ (N=81)		HR- HER2+ (N=49)		TNBC (N=66)	
	N	%	N	%	N	%	N	%
Bone	232	64.3	50	61.7	20	40.8	33	50.0
Median	65.0 months		51.5 months		35.0 months		33.0 months	
Lung	165	45.7	40	49.4	20	40.8	38	57.6
Median	64.0 months		52.5 months		34.0 months		30.5 months	
Liver	144	39.9	33	40.7	20	40.8	25	37.9
Median	55.5 months		48.0 months		36.5 months		25.0 months	
Brain	37	10.2	16	19.8	10	20.4	15	22.7
Median	59.0 months		47.0 months		30.0 months		25.0 months	
Others	121	33.5	35	43.2	15	30.6	21	31.8
Median	72.0 months		55.0 months		35.0 months		39.0 months	

Note: Distant recurrence may involve multiple sites at first detection.

Distant recurrence happened within 10 years after the date of first treatment was presented in the table.

Figure 3: Distant-disease-free survival of breast cancer patients in Hong Kong



Note: (a) all cases (N=7,468), (b) by cancer stage (N=7,468), (c) by age group (N=7,391) and (d) by biological subtype (N=6,981)

Conclusion

The current study based on HKBCR included a high proportion of patients reported in the Hong Kong Cancer Registry during the same period of time. With a median follow-up of 127 months, this was the first Hong Kong study to examine the 10-year survival of breast cancer patients in Hong Kong. The 10-year OS for stage 0, I, II, III and IV were 97.1%, 94.3%, 90.2%, 74.0% and 26.4% respectively. These findings were comparable to other countries/regions. However, it has to be noted that the current registry does not represent all the breast cancer patients diagnosed in Hong Kong during 2006 to 2011.

As mentioned above, cancer stage, age and biological subtype all showed significant effects on survival. The finding that early stage patients have lower risk of disease relapse and better survival highlighted the importance of early detection.

References

(Please refer to Chinese version)

Acknowledgements

We would like to express our gratitude to Dr. Polly CHEUNG, Dr. Chun-chung YAU, Dr. Lawrence LI and Prof. Winnie YEO for reviewing and editing this Bulletin.

The Hong Kong Breast Cancer Registry should be credited when any part of this document is quoted.

Suggested citation:

Hong Kong Breast Cancer Registry Bulletin Issue 13: 10-year survival analysis of breast cancer patients: Data from Hong Kong Breast Cancer Registry, published by Hong Kong Breast Cancer Foundation in September 2022.

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