Breast Cancer in Hong Kong Elderly Patients

Introduction

Breast cancer is the most common female cancer in Hong Kong. According to the Hong Kong Cancer Registry, 16-17% of all breast cancer patients diagnosed in Hong Kong during 2009-2013 were aged 70 or above[1]. The report further showed that the probability of developing breast cancer with increasing age is monotonic rising[1]. As we are all aware that the proportion of the population aged 70 or over is projected to rise from 10.5% to 15.8% in the coming 10 years[2], it is expected that the number of elderly breast cancer patients will increase with time.

Overseas studies found that while the tumours in older breast cancer patients had more favourable biological features (hormone receptors-positive, lower grade and lower proliferation rate)[3-6], the survival rate of elderly patients was lower than that of younger patients[7]. One of the aims of this study is to assess the tumour characteristics and the treatment practice in local elderly breast cancer patients.

With increasing age, patients develop more comorbidities[8] which often limit treatment options and influence patients' compliance[6,9,10]. The Charlson Comorbidity Index (CCI)[11] is a common validated tool that enables systematic ascertainment of comorbidities (Table 1). Another aim of this study is to investigate the impact of comorbidity, measured by CCI, in our elderly patients on their breast cancer treatment.

Methodology

The Hong Kong Breast Cancer Foundation maintains the Hong Kong Breast Cancer Registry (HKBCR) of local breast cancer patients. The study cohort was drawn from female patients initially diagnosed with breast cancer between 2006 and 2015. Among the 13,265 patients in HKBCR, 861 patients were aged 70 or above.

We looked into the following four areas among the elderly patients and compared to those of patients of all ages reported in HKBCR Report No.8:

a. Before diagnosis – how the breast cancer was first detected and the time interval between onset of symptoms and first medical consultation

b. Tumour characteristics – cancer stage at presentation, pathological and biological characteristics

c. Types of treatment – types of treatment adopted and how, if any comorbidity has affected the breast cancer treatment

d. Result of treatment and clinical outcome

Results of study

Among 861 patients in our study, more than two-thirds (70.4%) received public medical care, 11.7% received private medical care, and 17.9% received both private and public medical care.

a. Before diagnosis

Majority (87.4%) of the elderly patients self-detected their cancers by chance and 17.7% of them waited for more than a year to seek first medical consultation (vs. 10.8% for patients of all ages) (Table 2).

b. Tumour characteristics

8.7% of the elderly patients were diagnosed with stage 0 cancer (vs. 12.0% for patients of all ages) (Figure 1). 14.7% of the elderly patients were diagnosed with stage III or IV cancer, and among them, 27.5% waited for more than a year to seek first medical consultation. More information of cancer stage can be found in Figure 1.

Regarding the histology of tumour, 73.0% were invasive ductal carcinoma, slightly less than 76.5% for patients of all ages (Table 3). Around half (49.8%) of the elderly patients with invasive cancer had tumours larger than 20mm, which was slightly higher in proportion than the 46.6% for patients of all ages. Invasive tumours in elderly patients exhibited more favourable biological characteristics than those for patients of all ages, including more grade 1 tumours (26.5% vs. 19.2%) and absence of lymphovascular invasion (75.6% vs. 68.1%) .

Table 1	Charlson Comorbidity Index
Weights	**Comorbidity**
1	Myocardial infarction, congestive heart failure, peripheral vascular disease, cerebrovascular disease, dementia, pulmonary disease or asthma, rheumatic or connective tissue disease, gastric or peptic ulcer, mild liver disease, and diabetes
2	Hemiplegia, renal disease, diabetes with end organ damage, any tumour, leukemia, and lymphoma
3	Moderate or severe liver disease
6	Metastatic tumour, Acquired Immune Deficiency Syndrome

Table 2 First cancer detection method and time interval between onset of symptoms and first medical consultation for 861 elderly patients and 13,265 patients of all ages

	≧70 years old patients Number (%)		Patients of all ages Number (%)	
First detection method				
Self-detection by chance	714	(87.4)	10,449	(83.0)
Mammography screening	35	(4.3)	1,331	(10.6)
BSE or CBE	36	(4.4)	356	(2.8)
USG or MRI	17	(2.1)	352	(2.8)
Incidental surgery / others	15	(1.8)	101	(0.8)
Not known	44		676	
Time interval between onset of symptoms and first medical consultation*				
< 1 month	79	(34.1)	1,035	(36.5)
1 – 3 months	82	(35.3)	1,088	(38.3)
4 – 12 months	30	(12.9)	408	(14.4)
>12 months	41	(17.7)	307	(10.8)
Not known	482		7,611	

*For patients who self-detected cancers by chance only
BSE: Breast self-examination; CBE: Clinical breast examination;
USG: Ultrasound screening; MRI: Magnetic resonance imaging

Table 3 The pathological characteristics of the invasive tumours of the elderly patients and patients of all ages

|	≧70 years old patients (N=744) Number (%)		Patients of all ages (N=11,480) Number (%)	
Tumour histology				
Invasive ductal carcinoma	543	(73.0)	8,784	(76.5)
Invasive lobular carcinoma	24	(3.2)	377	(3.3)
Others	109	(14.7)	1,069	(9.3)
Not known	68	(9.1)	1,250	(10.9)
Tumour size				
≦10 mm	12	(1.9)	163	(1.7)
>10 mm but ≦20 mm	304	(48.3)	5,107	(51.7)
>20 mm but ≦50 mm	286	(45.4)	4,246	(43.0)
>50 mm	28	(4.4)	351	(3.6)
Not known	114		1,613	
Tumour grade				
1	165	(26.5)	1,834	(19.1)
2	323	(51.9)	4,326	(45.2)
3	134	(21.6)	3,413	(35.7)
Not known	122		1,907	
Lymphovascular invasion				
Yes	148	(24.4)	2,986	(31.9)
No	458	(75.6)	6,368	(68.1)
Not known	138		2,126	
Nodal status				
No positive node	460	(66.0)	6,631	(59.8)
1 – 3 positive nodes	158	(22.7)	2,936	(26.5)
4 – 9 positive nodes	50	(7.2)	980	(8.8)
≧ 10 positive nodes	29	(4.1)	547	(4.9)
Not known	47		386	
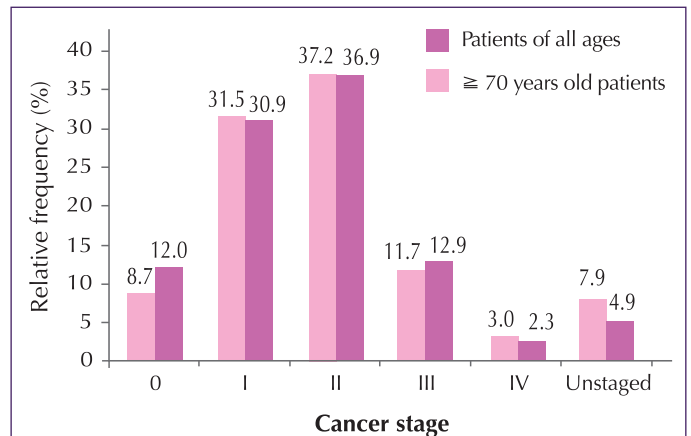
Figure 1 Cancer stage at diagnosis in our breast cancer patients

Over three-quarters (83.0%) of the invasive tumours in elderly patients were estrogen receptor (ER) positive, and was higher than the 78.1% for patients of all ages (Table 4). 70.8% of the invasive tumours in elderly patients were progesterone receptor (PR) positive, and was also higher than the 66.0% for patients of all ages. Furthermore, low Ki-67 proliferation index (<14%) was seen in 56.6% of the invasive tumours in the elderly patients, and was higher in proportion than the 40.6% for patients of all ages. Only 16.4% of the tumours in the elderly patients were HER2 positive, and was lower than the 21.3% for patients of all ages.

c. Types of treatment

Five (0.6%) elderly patients did not receive any treatment. Combinations of treatment were often used to treat breast cancer in elderly patients. Over three-quarters (77.8%) of the patients received two or more types of treatment.

With regard to surgery, 5.4% of the elderly patients did not receive surgery, which was higher than the 1.6% for patients of all ages (Table 5). Majority (81.7%) of the elderly patients had mastectomy, which was higher than the 57.3% for patients of all ages. Chemotherapy use increased with advancing cancer stage, from 3.1% in stage I to 42.3% in stage IV; but the use of chemotherapy as part of treatment was still far below than that for patients of all ages regardless of the cancer stage. Among elderly patients with HER2 positive tumours, only 14.4% received targeted therapy, which was much lower than the 54.9% for patients of all ages. Over three-quarters (78.8%) of the elderly patients received endocrine therapy, which was slightly higher than the 76.2% for patients of all ages. Regardless of the type of surgery received, more elderly patients did not receive radiotherapy as part of their treatment.

Table 4 The biological characteristics of the invasive tumours of the elderly patients and patients of all ages

	≧70 years old patients (N=744) Number (%)		Patients of all ages (N=11,480) Number (%)	
Estrogen receptor				
Negative	113	(17.0)	2,210	(21.9)
Positive	551	(83.0)	7,880	(78.1)
Not known	80		1,390	
Progesterone receptor				
Negative	193	(29.2)	3,420	(34.0)
Positive	469	(70.8)	6,649	(66.0)
Not known	82		1,411	
HER2				
Negative	551	(83.6)	7,892	(78.7)
Positive	108	(16.4)	2,136	(21.3)
Not known	85		1,452	
Ki-67 proliferation index				
<14%	137	(56.6)	2,262	(40.6)
≧14%	105	(43.4)	3,306	(59.4)
Not known	502		5,912	
Biological subtype				
Luminal A*	125	(19.0)	2,042	(20.4)
Luminal B (HER2 negative)#	50	(7.6)	1,861	(18.6)
Luminal A/B (HER2 negative) †	308	(46.9)	2,824	(28.2)
Luminal B (HER2 positive) ^	67	(10.2)	1,289	(12.9)
HER2 positive ✳	41	(6.2)	844	(8.4)
Triple negative disease §	66	(10.1)	1,150	(11.5)
Not known	87		1,470	

HER2: human epidermal growth factor receptor 2

* Luminal A: ER and/or PR+, HER2-, and Ki-67 index low (<14%)

\# Luminal B (HER2 negative): ER and/or PR+, HER2-, and Ki-67 index high (≧14%)

† Luminal A/B (HER2 negative):ER and/or PR+, HER2-, and Ki67 index not known

^ Luminal B (HER2 positive): ER and/or PR+, HER2+, and any Ki-67 index

✳ HER2 positive: ER and PR-, HER2+, and any Ki-67 index

§ TND (Triple Negative Disease): ER-, PR-, HER2-, and any Ki-67 index

The number of patients with different comorbidities included in the CCI was shown in Table 6. Only a small proportion of patients (4.5%) had a CCI ≧ 3. More than three quarters (76.6%) of patients had CCI of 0 at the time of cancer diagnosis. Among the elderly patients, 29.7% of those with CCI ≧ 3 did not receive surgery, which was much higher than that for patients with CCI <3 (Table 7). For patients who received breast-conserving surgery, 40.0% of those with CCI ≧ 3 did not receive radiotherapy after surgery, which was also much higher than that for patients with CCI <3. However, such difference was not observed in patients who received mastectomy.

Table 5 Cancer treatment among elderly patients and patients of all ages with invasive cancers

	≧70 years old patients (N=744) Number (%)		Patients of all ages (N=11,480) Number (%)	
Surgery				
No	40	(5.4)	186	(1.6)
Breast-conserving surgery	91	(12.2)	3,785	(33.1)
Mastectomy	608	(81.7)	6,562	(57.3)
Mastectomy+Reconstruction	2	(0.3)	885	(7.7)
Nodal surgery only	2	(0.3)	7	(0.1)
Type of surgery not known	1	(0.1)	20	(0.2)
Not known	0		35	
Chemotherapy				
Stage I cancer				
No	251	(96.9)	2,467	(61.5)
Yes	8	(3.1)	1,544	(38.5)
Not known	4		46	
Stage II cancer				
No	280	(90.3)	769	(16.0)
Yes	30	(9.7)	4,035	(84.0)
Not known	6		36	
Stage III cancer				
No	64	(66.7)	106	(6.3)
Yes	32	(33.3)	1,574	(93.7)
Not known	4		12	
Stage IV cancer				
No	15	(57.7)	40	(13.4)
Yes	11	(42.3)	259	(86.6)
Not known	0		3	
Targeted therapy*				
No	89	(85.6)	943	(45.1)
Yes	15	(14.4)	1,146	(54.9)
Not known	4		48	
Endocrine therapy				
No	155	(21.2)	2,682	(23.8)
Yes	576	(78.8)	8,605	(76.2)
Not known	13		193	
Radiotherapy				
Patients with breast-conserving surgery				
No	8	(9.1)	130	(3.5)
Yes	80	(90.9)	3,591	(96.5)
Not known	3		64	
Patients with mastectomy				
No	398	(66.8)	3,661	(50.0)
Yes	198	(33.2)	3,654	(50.0)
Not known	14		132	

* Among patients with human epidermal growth factor receptor 2 positive only

Table 6 Number of patients for each comorbidity included in the CCI (N=826)

Comorbidity	Number	(%)
Diabetes	106	(12.8)
Heart diseases (including myocardial infarction, congestive heart failure, peripheral vascular disease)	41	(5.0)
Any tumours	37	(4.5)
Metastatic solid tumours	25	(3.0)
Cerebrovascular disease	8	(1.0)
Dementia	4	(0.5)
Chronic bronchitis / COPD	3	(0.4)
Connective tissue disease	3	(0.4)
Mild liver diseases	3	(0.4)
Kidney disease	3	(0.4)

Table 7 Cancer treatment among elderly patients with different CCI

	CCI, Number (%)		
	0	1-2	≧ 3
Surgery			
Yes	584 (92.4)	148 (94.9)	26 (70.3)
No	48 (7.6)	8 (5.1)	11 (29.7)
Chemotherapy			
Stage I cancer			
Yes	6 (3.1)	1 (1.9)	1 (25.0)
No	188 (96.9)	53 (98.1)	3 (75.0)
Stage II cancer			
Yes	25 (10.2)	4 (7.3)	0 (0.0)
No	221 (89.8)	51 (92.7)	1 (100.0)
Stage III cancer			
Yes	25 (33.8)	8 (38.1)	0 (0.0)
No	49 (66.2)	13 (61.9)	1 (100.0)
Stage IV cancer			
Yes	—	—	10 (40.0)
No	—	—	15 (60.0)
Targeted therapy*			
Yes	12 (15.6)	3 (13.0)	0 (0.0)
No	65 (84.4)	20 (87.0)	3 (100.0)
Endocrine therapy			
Yes	464 (74.6)	120 (77.4)	27 (77.1)
No	158 (25.4)	35 (22.6)	8 (22.9)
Radiotherapy			
Patients with breast-conserving surgery			
Yes	81 (88.0)	15 (88.2)	3 (60.0)
No	11 (12.0)	2 (11.8)	2 (40.0)
Patients with mastectomy			
Yes	146 (30.7)	42 (32.8)	9 (45.0)
No	330 (69.3)	86 (67.2)	11 (55.0)

* Among patients with human epidermal growth factor receptor 2 positive only

d. Result of treatment and clinical outcome

Among 861 elderly patients included in this study, 745 were followed up. Around one-fifth (19.6%) of the patients were followed up for at least 5 years, whereas 46.8% of them were followed up for 2 – 5 years. 33.6% were followed up for less than 2 years.

29 (3.9%) patients experienced recurrence. 6 (0.8%) patients died from breast cancer, on average, 2.8 years after initial cancer diagnosis. 21 (2.8%) patients died from unrelated cause other than breast cancer.

Discussion

Our study results suggested that majority of the elderly patients self-detected their cancers by chance but upon the onset of symptoms, they took longer than patients of all ages in seeking first medical consultation. We advocate that public health education towards increased breast health awareness specifically targeting the elderly patients and their caretakers. This can promote the concept of "Early detection saves lives" and emphasize on the value of seeking prompt medical attention for any suspicious symptoms.

Our study is the first comprehensive local review of the elderly breast cancer patients, and the data showed that elderly patients often received less surgery, chemotherapy, targeted therapy and radiotherapy. For those who had surgery, elderly patients received more mastectomies than that for patients of all ages. Although age is an important factor to consider in decision-making for breast cancer treatment, it must not be the sole factor to determine the intensity and type of treatment. There is a tendency to withhold therapy in some elderly patients because of fear of toxicity or concern about comorbidity, this is especially true in advanced breast cancer patients. In some cases, however, such therapies may be highly effective and could improve both survival and quality of life. Age may influence breast cancer treatment, but it should not be the sole guiding principle, and this has been advocated at the ESO-ESMO 2nd international consensus guidelines for advanced breast cancer[12]. Results also suggested that comorbidity in elderly patients might have played a role in their treatment choices.

More local research especially prospective study with the incorporation of the Comprehesive Geriatric Assessment[13] is warranted to further investigate how comorbidity potentially affects breast cancer treatment and outcome of elderly patients.

Conclusion

Breast cancer risk increases with age and it is anticipated that the number of elderly affected by breast cancer will increase with time. Our study results have demonstrated that elderly patients tended to delay in seeking first medical consultation yet they received less aggressive cancer treatment modalities as compared to patients of all ages. Our data also suggested that comorbidity may have association with the treatment choices among elderly patients.

References

(Please refer to Chinese version)