

Clinical Characteristics of Breast Cancer Patients in Korea in 2000

Korean Breast Cancer Society*

Hypothesis: Breast cancer in Korea continues to rise year by year, and its clinical features will become closer to those now observed in Western countries.

Design: Nationwide multicenter survey of the Korean Breast Cancer Society in 2000.

Participants: A total of 5401 patients (median age, 46 years) with newly diagnosed breast cancer who underwent surgery at 38 university and 45 surgical training hospitals.

Main Outcome Measures: All participating hospitals provided the essential data, including sex, age, the surgical method used, and the American Joint Committee on Cancer classification to determine the clinical characteristics of breast cancer and to compare the results with those of previous surveys conducted in 1996 and 1998 to obtain an epidemiological pattern of breast cancer in Korea.

Results: An estimated crude incidence was 23/100 000 patients. Premenopausal women younger than 50 years constituted 61.2%. Of the study population, 71.5%

underwent mastectomy; 27.1%, breast-conserving surgery; and 1.4%, other surgical treatments. In all, 52.8% were diagnosed as having stage II disease (American Joint Committee on Cancer classification), and the proportion of early cancer (stages 0 and I) was 31.5%. Comparisons with 1996 and 1998 results indicated that the number of patients with breast cancer is increasing. Mastectomies occurred less frequently and breast-conserving surgery more frequently ($P < .001$), and we noted an increase in the proportion of early cancer ($P < .001$). The number of patients with risk factors such as early menarche ($P = .003$), late menopause ($P = .01$), a high-fat diet ($P = .048$), and familial history of breast cancer ($P = .046$) was also found to have significantly increased.

Conclusions: Although our epidemiological survey was limited in terms of its duration, our findings suggest that the incidence of breast cancer in Korea will continue to rise and that the clinical features will become closer to those now observed in Western countries.

Arch Surg. 2004;139:27-30

THE INCIDENCE OF BREAST cancer in Korea has continuously increased in recent years, although it is still quite low compared with its incidence in European countries and the United States. According to the cancer registration report issued by the Ministry of Health and Welfare, breast cancer ranked as the third most common cancer in women before 1998, became the most common cancer in 2001, and accounted for about 16.1% of all cancers in Korean women.¹ Worldwide, breast cancer is the second most common cancer in female patients and the most common form in developed countries such as the United States and several European countries. The estimate for the year 2000 was close to 1 million new cases per year worldwide, representing an increase of 23.9% from 1990 through 2000 or more than a 2% increase per year.²

The Korean Breast Cancer Society (KBCS) filed the first baseline data on breast cancer after performing a nationwide survey in 1996. Using the same

See Invited Critique and Invited Response at end of article

method, we recently attempted to determine the clinical characteristics of breast cancer in Korea to form a consensus for early diagnosis and treatment on an annual basis. The role played by the KBCS in this area is increasingly important, because the incidence of breast cancer is steadily on the increase owing to many factors, including the popularity of the early cancer detection campaign and the rapid westernization of lifestyle (eg, high-fat diet, non-breastfeeding, and late marriage). The purpose of this study was to identify the

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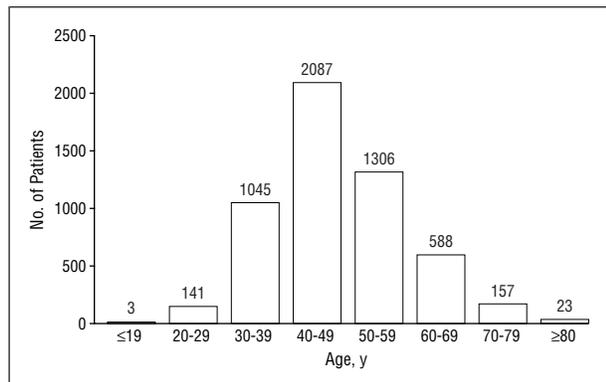


Figure 1. Age distribution of Korean breast cancer patients in 2000.

clinical and epidemiological characteristics of female breast cancer, including age distribution, therapeutic modalities used, disease stage diagnosed when first seen, various risk factors, and the chronological changes compared with the earlier surveys of 1996 and 1998.

METHODS

The patients undergoing the current analysis all had newly diagnosed cancer and underwent surgery from January 1 through December 31, 2000, at hospitals in Korea. Nationwide, all 41 university hospitals and 69 surgical training hospitals were invited to participate in this study. Of these, we excluded 3 university hospitals that were recently built and had no breast cancer data by that time and 24 surgical training hospitals that had few new cases or problematic data collection. The remaining 38 university hospitals and 45 surgical training hospitals participated in the project. All data were received from participating hospitals in the form of recorded cancer registration sheets, and information was arbitrarily grouped into essential and optional items. All participating hospitals answered the essential items, including sex, age, the surgical method used, and the American Joint Committee on Cancer classification. The essential items were available for analysis in 5401 patients. The optional items included symptoms and signs, physical findings, laboratory examination data, biological markers, operative and histopathological findings, and risk factors (optional data items are not presented in this article). We used the χ^2 test to compare the results of 1996 and 2000. For comparisons, $P < .05$ was considered significant.

RESULTS

SEX AND AGE DISTRIBUTION

The 5401 patients in total included 5376 women (99.5%) and 25 men (0.5%). Most patients ($n=2087$ [39%]) were in their fifth decade of life, followed by the sixth ($n=1306$ [24.2%]), fourth ($n=1045$ [19.3%]), seventh ($n=588$ [10.9%]), eighth ($n=157$ [2.9%]), third ($n=141$ [2.6%]), ninth ($n=23$ [0.4%]), and second decades ($n=3$ [0.1%]) of life. Fifty-one cases were excluded because their age data were not available (**Figure 1**). Their median age was 46.0 years, with ages ranging from 16 to 87 years.

SURGICAL METHODS

Of 5355 patients (after excluding 46 patients whose data of operation method were not available), modified radi-

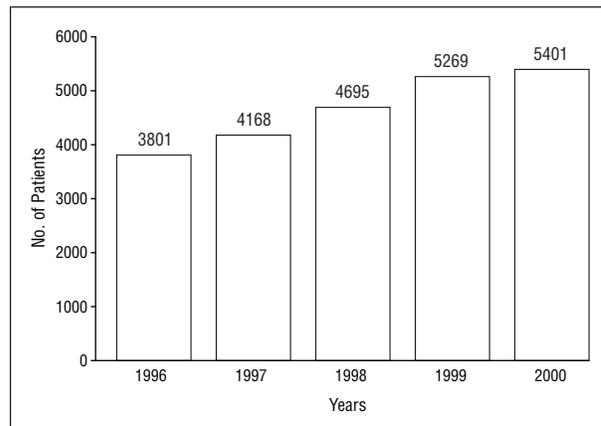


Figure 2. Annual number of breast cancer patients in Korea.

cal mastectomy was the most frequently used method and was conducted in 3601 cases (67.2%). Breast-conserving surgery was performed in 1450 cases (27.1%), simple mastectomy in 123 cases (2.3%), and radical mastectomy in 104 cases (1.9%). Of 1450 cases treated with breast-conserving surgery, lumpectomy or quadrantectomy with axillary dissection was performed in 1308 cases (24.4%), and tumor resection only or segmentectomy without axillary dissection was performed in 142 cases (2.7%). Tissue biopsy was performed in 48 cases (0.9%), and other pathological methods were used in 29 cases (0.5%).

STAGING ACCORDING TO AMERICAN JOINT COMMITTEE ON CANCER CLASSIFICATION

Excluding patients in whom cancer staging results were uncertain or included other breast malignancies such as malignant phyllodes tumor and lymphoma, the breast cancer stages of 4412 patients were as follows: stage 0 in 273 (6.2%), stage I in 1118 (25.3%), stage IIA in 1432 (32.5%), stage IIB in 897 (20.3%), stage IIIA in 484 (11.0%), stage IIIB in 112 (2.5%), and stage IV in 96 (2.2%). The proportion of early stage 0 or I cancer was 31.5%, and stage II cancer was the most prevalent (52.8%).

COMMENT

According to the Ministry of Health and Welfare (Central Cancer Registry Program), the breast is the most common site of primary cancer in women in Korea since 2001. Among cancers in female patients, the proportion of breast cancer has steadily increased from 9.3% in 1982 to 16.1% in 2000.¹ According to the annual reports of the Central Cancer Registry Program, cancers of the breast, colon, lung, and liver are on the increase, but the incidence of gastric and cervical cancers is decreasing. Such trends in cancer epidemiology in Korea could be in part related to a changing pattern of lifestyle toward that of the Western countries.

The KBCS has been conducting annual nationwide breast cancer surveys since 1996. These surveys have revealed that the numbers of new patients with breast cancer have continuously increased from 3801 patients in 1996, 4168 in 1997, and 4695 in 1998 to 5401 in 2000 (**Figure 2**).^{3,4} The crude incidence has also increased to

Proportion of Breast Cancer Patients With Risk Factors in Korea by Year*

Risk Factor	Year			P Value†
	1996	1998	2000	
Early menarche (<13 y)	8.0	7.7	11.8	.003
Late menopause (>55 y)	6.5	10.2	11.7	.01
Late first delivery (>30 y)	11.1	10.2	12.3	.41
No child	9.0	7.0	7.9	.37
Unmarried	5.1	4.3	4.9	.86
Non-breastfeeding	21.2	17.8	20.7	.77
High-fat diet	5.6	7.1	8.5	.048
Family history of breast cancer	3.2	5.0	4.8	.046
Obesity (BMI >25)	31.7	32.5	25.8	.005
Median age, y	46.9	47.0	46.0	

Abbreviation: BMI, body mass index (calculated as weight in kilograms divided by the square of height in meters).

*Unless otherwise indicated, data are expressed as percentage of patients.

†Compared with 1996, the proportion of early menarche, late menopause, high-fat diet, and family history of breast cancer was significantly increased in 2000.

23/100 000 women in 2000, from 16.7/100 000 in 1996 and 20.3/100 000 in 1998, although these incidences are nevertheless considerably lower than the world average (29.8/100 000 women). The present study revealed that the age distribution of breast cancer peaks in the fifth decade of life, followed by the sixth and fourth decades. This distribution pattern has not changed since the initial survey was conducted in 1996. This curve shape has also been observed in other Asian countries. In contrast, the age distribution in the United States and in other Western countries presents as a linear increase with age, with a peak age some 20 to 30 years older than that in Korea. Unlike that in the United States, the population in our study included more premenopausal than postmenopausal women. The American Cancer Society reported that patients older than 50 years constituted 76.8% of all breast cancer patients, with a peak incidence in the eighth decade of life.⁵

The incidence of male breast cancer in our series was 0.5% (25 cases), which is lower than the 1% reported in Western countries.

The American College of Surgeons Commission on Cancer and the American Cancer Society reported that a dramatic shift in the surgical treatment of breast carcinoma had occurred during the past 10 years, based on the data collected during a 10-year national survey of breast carcinoma treatment at US hospitals.⁶ That study revealed an increase in breast-conserving surgery from 22% to 45.7%, which contrasted with a decreased use of modified radical mastectomies from 56.5% to 42.8% in United States. Robert et al⁷ reported on an Edinburgh, Scotland, study and found that 25% to 31% of patients received breast-conserving surgery. The National Cancer Institute Consensus Conference in 1990 indicated that breast-conserving surgery for stages I and II breast cancer resulted in no different overall and disease-free survival rates compared with radical surgery, but proved that the technique has fewer surgical complications and a better cosmetic effect.⁸ It appears that breast-conserving surgery is also on the rise in Korea. The present study showed that mastectomy was performed most frequently, but that it is decreasing proportionately (79.7% in 1996 and 71.5% in 2000). On the other hand, breast-conserving surgery has been slowly increasing from 18.7% in 1996 to 23.8%

in 1998 to 27.1% in 2000 ($P < .001$). Such an increase is expected to continue as early detection measures, including ultrasonographic and mammographic screenings, reinforced with sonographically guided biopsy, are more widely practiced.

Comparisons with previous nationwide surveys show a striking increase in the percentage of stage 0 and I tumors, ie, from 23.8% in 1996 to 31.5% in 2000 ($P < .001$). In addition, increased early breast cancer detection using screening mammography seems to have helped increase the rate of ductal carcinoma in situ from 4.2% in 1996 to 6.2% in 2000. Several studies performed in Korea,⁹⁻¹² including our own, indicate that breast cancer is most frequently diagnosed at stage II (31.8%-59.9%), whereas early cancer is detected in 9.3% to 33%. This rate is considerably lower than that in Western countries. Bland et al⁶ reported that the sum of stage 0 and I breast cancers markedly increased from 42.5% in 1985 to 56.2% in 1995 in the United States.

Concerning the risk factors of breast cancer in Korea, the main epidemiological risk factors can be explained by the estrogen-augmented-by-progesterone hypothesis.¹³ Thus, epidemiological studies performed in Korea¹⁴ have shown that older age, a family history of breast cancer, early menarche, late menopause, a late full-term delivery, and never breastfeeding a child are the primary risk factors for breast cancer. Our national survey indicated several important changes in the risk factors year by year (**Table**). The incidence of patients with menarche before 13 years of age ($P = .003$), menopause after 55 years of age ($P = .01$), high-fat diets ($P = .048$), and a family history of breast cancer ($P = .046$) in the present study was significantly increased compared with 1996. In postmenopausal women who had experienced a full-term pregnancy and breastfeeding, a 4- to 7-fold reduction in risk was observed.¹⁵

A case-control study in Korea showed that postmenopausal obesity is an important risk factor for the development of breast cancer, and that this may be related to the estrogen-augmented-by-progesterone hypothesis.^{16,17} Obesity has been related to early menarche and late menopause.¹⁸ Yoo et al¹⁹ reported a positive correlation between breast cancer incidence and foods of animal origin,

and a negative correlation between breast cancer and foods of vegetable origin. It is presumed that a high-fat diet may contribute, perhaps indirectly, to the development of breast cancer. Although the incidence in Korea is much lower than that in Western countries, our survey findings suggest that there is no difference in breast cancer risk factors between Korea and Western countries. The rate of breast cancer development in Korea is expected to rise with an increase in high-caloric high-fat diets, due to the Westernization of the Korean diet, fewer full-term deliveries, and older age at the first delivery. The American Cancer Society reported that the currently known risk factors explain breast cancer in only one fourth of patients and that, therefore, further research is needed on risk factors.²⁰ In this context, it is encouraging that guidelines for the screening of breast cancer have been proposed by the KBCS. It is essential that a nationwide survey of actual survival rate be conducted to ensure the appropriate and cost-effective treatment of breast cancer patients.

CONCLUSIONS

The KBCS has been conducting a nationwide survey on breast cancer and its clinical and epidemiological characteristics since 1996. The present study shows a continuous increase in the incidence of breast cancer, breast-conserving surgery, the proportion of early cancer, and the number of patients with risk factors such as early menarche, late menopause, a high-fat diet, and a family history of the breast cancer. These results suggest that the rate of breast cancer in Korea is set to continuously increase in the future and that the pattern of breast cancer in Korea is perhaps changing to that observed in Western countries.

Accepted for publication June 7, 2003.

The Korean Breast Cancer Society thanks the following members who participated to this nationwide study: S. H. Ahn, J. W. Bae, Y. T. Bae, J. W. Baek, J. G. Bong, K. H. Cha, E. S. Chang, I. T. Chang, S. S. Chang, J. W. Cho, S. H. Cho, Y. U. Cho, J. W. Choi, K. J. Choi, M. S. Choi, S. I. Choi, S. Y. Choi, G. S. Goo, S. H. Han, J. Y. Hwang, T. I. Hyun, Y. J. Jegal, M. G. Im, Y. G. Joh, S. Y. Jun, B. W. Jung, J. H. Jung, K. H. Jung, P. J. Jung, S. H. Jung, S. S. Jung, Y. H. Jung, H. J. Kang, Y. I. Kang, Y. J. Kang, J. H. Keum, D. Y. Kim, J. H. Kim, J. S. Kim, J. S. Kim, K. C. Kim, S. C. Kim, S. H. Kim, S. J. Kim, S. Y. Kim, S. Y. Kim, Y. S. Kim, B. K. Ko, S. H. Koh, B. H. Koo, J. Y. Koo, C. H. Lee, C. H. Lee, D. H. Lee, D. S. Lee, E. S. Lee, G. S. Lee, H. D. Lee, H. S. Lee, J. C. Lee, J. H. Lee, J. K. Lee, J. Y. Lee, K. M. Lee, K. P. Lee, K. S. Lee, K. Y. Lee, M. H. Lee, R. A. Lee, S. C. Lee, S. J. Lee, S. K. Lee, W. Lee, Y. H. Lee, J. W. Leu, C. H. Lim, B. I. Moon, Y. S. Nam, S. J. Nam, D. Y. Noh, W. C. Noh, S. J. Oh, S. S. Oh, W. K. Pae, I. W. Paik, N. S. Paik, B.

G. Park, B. W. Park, C. H. Park, H. B. Park, H. Y. Park, J. H. Park, K. H. Park, S. J. Park, S. T. Park, S. W. Park, W. C. Park, Y. K. Park, Y. K. Park, H. S. Seo, K. H. Seo, Y. J. Seo, Y. S. Sin, B. H. Son, G. S. Son, B. J. Song, K. H. Song, Y. J. Song, Y. J. Suh, J. M. Won, D. H. Woo, D. H. Yang, J. H. Yang, S. Y. Yoo, H. S. Yoon, J. H. Yoon, and S. O. Yoon.

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