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Breast cancer screening in Korea

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Background: The screening campaigns of breast cancer have been constantly increasing since the benefit of screening in breast cancers had been established. The purpose of this study was to investigate the efficacy of annual breast screening, which included a mammography and a clinical physical examination.

Materials and Methods: From March 1995 to July 2004, we performed 110,588 annual clinical examinations and mammographies on 58,024 women, who wanted to undergo breast cancer screening. Two hundred fourteen breast cancers were detected during screening, and 161 patients of these were operated. The results are compared with the ideal rates for medical audits.

Results: Of the 110,588 cases screenined, the recall rate for further examination was 12.1% (n = 13,423). The biosy rate was 1.01% (N = 1,116). 214 breast cancers were detected: a detection rate of 0.19%. One hundred thirty four patients were the 1st visitors. The pathologic results of benign disease after biopsies were ordered fibrocystic change, fibroadenoma, adenosis, etc. Invasive ductal cancers is the most common among cancers. Stage 0 among cancer was 23.6%, stage I 40.4%, stage IIa 19.9%, stage IIb and IIIa 6.2%, stage IIIc 3.1%, and stage IV 0.6%. Positive predictive value (PPV) based on abnormal findings at screening examination was 1.6% (PPV1). PPV when a biopsy or surgical consultation were recommended, was 19.1% (PPV2). Tumor found as stage 0 or I was 64% (103/161). Tumor found as minimal cancer (stage 0 or tumor lesser than 1 cm) was 38.5% (62/161). There were 38 cases of axillary lymph node metastasis (23.6%). Cancers found per 1,000 cases was 1.7. Prevalence cnacer found per 1,000 first examinations was 2.3. Incidental cancer found per 1,000 follow-up examinations was 1.2. These results were compatible with the ideal rates for medical audits, except for PPV1, PPV2, cancers found per 1,000 cases.

Conclusions: On the base of these results, breast cancer screeing was properly performed in this institution. Breast cancer screeing using a clinical examination and a mammography is effective in the early detection of breast cancer.

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Initial results of national mammographic breast cancer screening program in Croatia

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Purpose: To present organization, scope and initial results of national mammographic breast cancer (MBC) screening program in Croatia.

Methods and Materials: In October 2006 national MBC screening program officially commenced in Croatia (population 4.3 millions), financed and coordinated by Ministry of Health. Women in the age group of 50−69 years (560 thousand) are included, and invited for mammography on biannual basis. Invitations and statistical evaluation of findings are managed by regional and central institutes for public health. BI-RADS lexicon was translated in Croatian language with permission of ACR. All radiologists participating in program received the lexicon and BI-RADS categorization is exclusively used for assessment of findings and statistical follow-up. The double-reading is mandatory. Program is coordinated centrally, with radiologists responsible for monitoring and quality-control of screening units in four geographic regions. Mammographic equipment must be less than ten years old, with regular maintenance and quality control. Centers for management of women with BI-RADS 3−5 findings were designated for various regions.

Results: Overall attendance rate in the first year is 55%, with wide geographical variations between counties (38.4% to 70%). Distribution of BI-RADS finding is: BI-RADS 0 12.5%; BI-RADS 1 40.5%; BI-RADS 2 37.2%; BI-RADS 3 8.5%; BI-RADS IV 1.2%, BI-RADS V 0.14%. The rate of 5.5 cancers found per 1000 mammographies was observed according to initial incomplete statistical results. Shortcomings of project will be discussed and latest results presented.

Conclusion: Mammographic BC screening was introduced in Croatia on a national basis. Many problems are encountered, but initial results are acceptable.

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Breast density and indicators of screening performance in the Quebec Breast Cancer Screening Programme (PQDCS), 1998–2003

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Background: Evaluations of screening programs rely heavily on the use of indicators of performance such as sensitivity and specificity but also on indicators related to sensitivity (detection rate, interval cancer rate) and specificity (recall rate, false-positive rate). We examined the relation of breast density to all of these indicators and compared results obtained with sensitivity and specificity to those obtained with sensitivity and specificity related indicators respectively.

Methods: The analysis is based on 850,918 screening examinations (512,549 women) done in the PQDCS in 1998–2003 including 4,744 screen-detected cancer cases, 83,917 false-positive examinations, 478 interval breast cancers diagnosed in the year after a negative mammogram and 761,779 negative examinations at screening with no diagnosis of breast cancer in the following year. Breast density was evaluated at screening (<25%, 25−49%, 50−75%, >75%). Multivariate log-binomial regressions were done.

Results: Compared to women with <25% density, women with >75% density had a 2.15 fold increase in measured breast cancer prevalence. Women with >75% density also had a 28% decrease in sensitivity (RR = 0.82) but an 82% increase in detection rate (RR = 1.82), a 4.36 fold increase in 1-sensitivity but a 9.29 fold increase in interval cancer rate. Moreover, >75% density was associated with a 1.78, 1.78 and 1.77 fold increase in 1-specificity, recall rate and false-positive rate respectively. All of these associations were statistically significant.

Conclusion: Breast density affects both sensitivity and specificity. Variations in detection and interval cancer rates can be poor indicators of variations in sensitivity when the groups compared differ in breast cancer prevalence. Thus, variations in these indicators across centers, regions or programs can be interpreted as reflecting variations in sensitivity only if there are little or no variations in disease frequency. Adjustment for key risk factors may be needed for proper interpretation of variations in these indicators in terms of variations of sensitivity.

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Breast cancer screening: evidence for false reassurance?

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Background: Tumour stage distribution at repeated mammography screening is, unexpectedly, often not more favourable than stage distribution at first screenings. False reassurance, i.e. delayed symptom presentation due to having participated in earlier screening rounds, might be associated with this, and unfavourably affect prognosis.

Methods: A consecutive group of 155 breast cancer patients visiting a breast clinic in Rotterdam (the Netherlands) completed a questionnaire on screening history and self-observed breast abnormalities. The length of time between the initial discovery of breast abnormalities and the first consultation of a general practitioner ('symptom-GP period') was compared between patients with ('screening group') and without a previous screening history ('control group'), using Kaplan–Meier survival curves and two-sided log-rank testing.

Results: Of the 155 patients, 84 (54%) had participated in the Dutch screening program at least once before tumour detection; 32 (38%) of whom had noticed symptoms. They did not significantly differ from control patients (n = 42) in symptom-GP period (Table). Only two out of 53 patients (3.8%) with screen-detected cancer had noticed symptoms prior to

screening, reporting symptom-GP periods of 2.5 and 4 years. The median period between the first GP- and breast clinic visit was 7.0 days (95% CI 5.9−8.1) in symptomatic screened patients and 6.0 days (95% CI 4.0−8.0) in control patients.

Conclusion: Our results show that false reassurance played, at most, only a minor role in breast cancer screening.

Patient group	Symptomatic screened group	Control group	P value
Total number included	N = 32	N = 42	
Time in days between discovery of the (first) symptom and the first GP visit			
(Median, 95% CI)	7.0 (0.0−15.3)	13.5 (7.3−19.7)	0.9 [a]
(⩾30 days: n, %)	10 (31.2)	13 (31.0)	0.9 [b]
(⩾90 days: n, %)	4 (12.5)	8 (19.0)	0.4 [b]
Time in days between first GP visit and first breast clinic visit			
(Median, 95% CI)	7.0 (5.9−8.1)	6.0 (4.0−8.0)	0.9 [a]
(⩾10 days: n, %)	7 (21.9)	11 (26.2)	0.6 [b]

[a]Kaplan–Meier, [b]Chi square test.

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Development of blood based gene expression test to detect early stage breast cancer in an Indian population

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Background: We have previously reported in 3 separate studies [1−3] the potential use of gene expression profiling in peripheral blood cells for early detection of breast cancer. Recently, we presented results from a study using Scandinavian/American women and a 96 transcript-set for the classification of breast cancer with an accuracy of 82%, sensitivity of 87% and specificity of 76% [4]. ROC analysis showed an area under the curve for these studies to range from 0.80 to 0.89. The current study investigates the efficacy of the blood based test with an Indian cohort.

Methods: We have initiated a large clinical trial tot test the efficacy of a 96 transcript set for detecting breast cancer in an Indian population. The patient population includes approximately 720 subjects with or without breast cancer from various geographical locations within India, including the North, South, East and West of India. The healthy population includes women with benign lesions, and women with no mammographic findings. Recruitment for breast cancer patients includes early and late stage cancers. The standard of truth for benign and cancerous findings was histopathology or cytology. Recruitment for all cohorts is age balanced to include women below and above the age of 50 in order to obtain both pre- and post-menopausal women. All laboratory handling of blood and gene expression testing was performed in India outside of the DiaGenic laboratory. The study population will be divided into a training set and a test set for validation of diagnostic efficacy. Recruitment for this study is planned to continue until early 2008 and the latest interim data is presented.

Results: An interim analysis has been performed with 113 subjects from multiple centres. The results obtained indicate that the informative transcripts identified from Scandinavian/American women efficiently discriminate breast cancer from non-breast cancer in Indian women. The sensitivity and specificity of the test lies in the same range as that presented above for previous studies, with an area under the curve (AUC) from receiver operator curve (ROC) analysis of 0.83.

Conclusion: The interim data from 113 Indian subjects suggests that transcripts identified from a Scandinavian/American cohort are informative for discirminating breast cancer from non-breast cancer. The AUC from ROC analysis of 0.83 suggests a potential role of this test as an additional tool in the breast cancer diagnostic work-up in India.

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Internal mammary lymph drainage and sentinel node biopsy in breast cancer – a study on 1008 patients

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Background: Nowadays, axillary sentinel node (SN) biopsy is a standard procedure in the staging of breast cancer. Although the internal mammary (IM) lymph node status is a major independent prognostic factor in breast cancer patients, sampling of IM sentinel nodes (IMSNs) is not performed routinely. The aim of this study was to evaluate the relevance of IMSN biopsy as a method to improve staging and determine the likelihood of finding IM lymph node metastases in case of IM hotspots on lymphoscintigraphy.

Material and Methods: Between April 1997 and May 2006, a total of 1008 consecutive patients with clinically node-negative operable primary breast cancer were enrolled in a prospective study on SN biopsy. Both axillary and IMSNs were sampled, based on lymphoscintigraphy, intraoperative gamma probe detection and blue dye mapping, using 10 mCi (370 MBq) 99mTc-nanocolloid injected peritumorally, and 0.5–1.0 ml Patent Blue V injected intradermally.

Results: Lymphoscintigraphy showed axillary sentinel nodes in 98% (989/1008) and IMSNs in 20% of the patients (196/1008). Sampling the IM basin, as based on the results of lymphoscintigraphy, was successful in 71% of the patients (139/196) and revealed metastases in 22% (31/139). In 29% percent of the patients with positive IMSN's (9/31) no axillary metastases were found.

Conclusions: Evaluation of IMSNs improves nodal staging in breast cancer. Patients with IM hotspots on lymphoscintigraphy have a substantial risk (22%) of metastatic involvement of the IM chain. In addition, true IM node-negative patients can be spared the morbidity associated with adjuvant radiotherapy.

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The sensitivity of breast tomosynthesis compared to digital mammography in the detection of breast cancer in patients referred to an outpatient breast clinic, a prospective analysis

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Background: Mammography is the first radiological method of investigation in symptomatic patients with breast abnormalities, despite its well-known false-negative rate. Tomosynthesis is a new method to detect breast cancer. We conducted a prospective study in which we investigated the value of Tomosynthesis in a group of patients, referred to our outpatient breast cancer clinic.We compared the sensitivity of tomosynthesis alone with digital mammography alone.

Material and Methods: From 1−6–2006 until 1−6–2007, 1028 women visited our outpatient clinic. 513 participated in the study. In these patients, digital mammography and tomosynthesis were performed. The sensitivity to detect breast cancer was compared.

Results: Malignancy was diagnosed in 193 patients. In 85 of these cases, the Birads-classification was 6. The Birads score of the other 108 breasts with carcinoma is presented in the table.

Birads	Mammography	Tomosynthesis
0	0	1
1	5	6
2	2	0
3	19	11
4	40	37
5	42	53

Without further workup (ultrasound and biopsy), 6 of 108 carcinomas would have been missed using tomosynthesis alone (classified: Birads 1), 7 carcinomas using Mammography alone (Birads 1 or 2).

Two carcinomas would have been missed using both techniques combined. The addition of tomosynthesis to standard digital mammography detected five more carcinomas.

Conclusion: The addition of tomosynthesis to mammography detected five more carcinomas, but four of them (in our group of symptomatic