in cancers prior to 1988. However survival within each NPI group has improved, due to better therapy. Recalculation is based on new figures and the prediction is compared with the observed outcome:

Invasive cancer	Diagnosed (n)		Predicted survival at 6 years (n)		Observed survival (median FU 6 years) (n)	
	C	T	C	T	C	T
GPG	92	113	89	110	91	111
MPG	87	96	71	79	69	85
PPG	22	20	11	10	14	11
Total	2010	229	171 (86%) NS	199 (87%)	174 (87%) Relative fatality 0.77 (0.45–1.35)	207 (90%)

There is good agreement between the predicted and observed 6 year survivals, neither show significant difference between C and T groups. Although in the Trial group there were more cases in the GPG and less in the PPG, this was not large enough to significantly improve survival and the absolute difference is 3% less deaths in the trial group at 6 years.

Conclusion: There is no significant advantage to annual screening over the standard 3 yearly NHS screening and shortening of the screening interval would certainly not be cost effective.

109 ORAL

Final results of Russia/WHO prospective randomized trial of breast self-examination (1985–2003)

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This study was conducted to determine whether an intensive program of breast self-examination (BSE) instruction will reduce the number of women dying from breast cancer.

Methods: Between 1985 and 1989, 96,292 (from 198,126) women (ages 40–64 y) in 14 randomly selected polyclinics in St. Petersburg and in 50 industrial polyclinics in Moscow were taught BSE (randomisation by the WHO, Geneva, Switzerland). 101,834 women in 64 other randomly selected polyclinics were controls. Physicians provided weekly breast clinics in all 128 polyclinics. Women were able to seek consultation either by self-referral or on the advice of their physician. For both BSE and control groups, all identified abnormalities were biopsied and treated at the oncological institutes.

Results: BSE compliance was 76.4% at the end of the eighth year of the study. More women in the BSE group came to the breast clinic for suspected pathology (7061) than in the control group (3825; p0.05). More benign breast lesions were diagnosed in the BSE group (1032) than in control group (547; P<0.05). The number of cancers diagnosed was similar in the BSE and the control groups (733 and 702 respectively, P=0.09). Kaplan-Meier 15-year survival from the time of diagnosis of breast cancer was 53.8% for the BSE group and 51.1% for control (P>0.5). There were 338 (0.35%) breast cancer death in the BSE group and 343 (0.33%) in the control group (N.S.).

Conclusion: Intensive teaching in BSE did not reduce mortality from breast cancer.

110 ORAL

Additional breast lesions in patients with breast cancer at MR imaging: impact on clinical management

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Purpose: 1. To inventory the additional workup for lesions detected at MR imaging in patients eligible for breast-conserving therapy (BCT) on the basis of conventional imaging and palpation, and to inventory the impact of this workup on clinical management. 2. To evaluate the performance of clinical reading to exclude malignancy with high confidence without additional workup.

Material and Methods: 116 patients with 118 proven breast cancers underwent MRI of both breasts prior to BCT. Additional lesions were enhancing lesions other than the proven cancer. The frequency of occurrence of additional lesions, the additional workup that was required, and the number of patients in which treatment was changed due to more extensive disease detected by MRI were established. The performance of clinical reading, and the performance of the combination of clinical reading and computerized analysis were obtained in the task of excluding malignancy at high confidence.

Results: MRI showed a larger extent of the index lesion in 10% of the patients (n=12). Furthermore, 50 additional lesions in 40 patients (35%) were detected. Twenty lesions were proven to be malignant, 30 were benign (7 pathology-proven, and 23 by follow up). Additional conventional workup (MRI-directed ultrasound-guided fine-needle aspiration or core biopsy) before surgery was performed in 78% of the additional lesions (39/50). In almost half of the cases (49%), the lesion was visible at workup and diagnosed by pathology. Treatment was changed to a more extensive approach in 22% (n=25). The specificity of clinical reading of additional lesions was 30% at 100% sensitivity (mean follow up 21 months). The combination of clinical reading with computerized analysis yielded higher specificity (96.6%) without loss of sensitivity.

Conclusion: In approximately half of the additional lesions conventional work up is useful to obtain the diagnosis. Clinical reading yields a low performance in identifying benign additional lesions. A significantly better performance is achieved by combining clinical reading with computerized analysis.

111 ORAL

Stereotactic directional vacuum-assisted breast biopsy in 480 patients with microcalcifications: radiological and pathological correlation

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Background: Radiological criteria exist to assess microcalcifications (MCs) on mammograms. On the basis of the level of suspicion, lesions can be categorized according to the Breast Imaging Reporting and Data System (BI-RADS). We compared radiological analysis and histopathological findings of microcalcifications on mammography.

Material and methods: 480 consecutive MCs were analyzed and biopsied. Neither a palpable tumor nor a visible mass in mammograms or ultrasound was associated with the area of MC. Before biopsy, MCs were classified on mammograms by two experienced radiologists as probably benign (BI-RADS III), indeterminate (BI-RADS IVa), suspicious (BI-RADS IVb) or malignant (BI-RADS V) using the following criteria: MC morphology as punctate, pleomorphic, and branching, respectively; microcalcification distribution as diffuse, clustered, linear, or segmental, respectively. In addition, progression was assessed with earlier mammograms. Stereotactic biopsies were performed on a prone dedicated table with an 11-gauge vacuum assisted Mammotome®-biopsy device. Histopathological and radiological diagnoses were compared.

Results: Histopathology of MC bearing tissue revealed 321 (67%) benign lesions [adenosis and other fibrocystic changes 207, fibroadenoma 67, fat necrosis and scar 22, and other benign lesions 25). 159 (33%) were malignant lesions (ductal carcinoma in situ (DCIS) 110, DCIS and invasive cancer 23, "minimal intraductal neoplasia" (differential diagnosis atypical ductal hyperplasia versus non-high grade DCIS) 24, and CLIS 2]. Of the 480 lesions, 77 were classified radiologically as probably benign (BI-RADS III), 198 as indeterminate (BI-RADS IVa), 76 as suspicious (BI-RADS IVb), and 2 as malignant (BI-RADS V). Benign lesions were classified accurately as BI-RADS III lesions in 19%, and as suspicious lesions in 34%. Malignant lesions were classified as suspicious or malignant lesions in 61%.

Conclusions: There is considerable overlap in the mammographic appearances of benign and malignant MC lesions. Stereotactic vacuum assisted biopsies proved to be a safe and accurate method to assess MCs. We suggest that MCs should be biopsied preoperatively.

112 POSTER HIGHLIGHT

The effect of screening on mortality

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Invasive cancers: Prognosis has greatly improved in recent year. The effect of screening has been difficult to calculate because of coincidental therapeutic improvements. Use of the Nottingham Prognostic Index (NPI) allows such analysis: earlier detection increases percentages in the better groups, whereas therapies improve prognosis within prognostic groups. The overall effect in the screening age group (50–64) on the whole tumour set (screen detected and symptomatic) at NCH is calculated.

DCIS: 25% of screen detected cases are DCIS (an excess of 20%), 70% of these are high grade. Taking the best estimates of the rate of development of invasive tumours from DCIS and their grades, the number of invasive tumours averted by treating the excess DCIS is calculated. The

relation of subsequent invasive grade to DCIS grade is known and therefore the survival of these according to grade can be calculated. This calculation shows that of every 100 cases diagnosed without screening 4 deaths would have been prevented by screening diagnosis of DCIS. Although screening has diagnosed 11% more in the best 21 prognostic groups and 11% less in the worst 2, this only increases survival by 4%.

NPI	Prior to screening 1980–86		Invited for screening 1993–96	
Group	% in grp	Observed 10yr n surviving (no adjuvant therapy)	% in grp	Expected 10yr n surviving (adjuvant therapy)
E	12	10	19	16
G	19	12	23	14
MI	30	18	29	17
MII	24	10	16	7
P	15	2	12	2
Overall	100	52%	100	56%

Conclusion: Population Breast Screening in women aged 50–65 is making an absolute reduction in deaths from breast cancer of 8% (Relative risk reduction 16%). Half of this is due to earlier detection of invasive tumours and half from the diagnosis of DCIS.

113 POSTER HIGHLIGHT

Increased breast cancer incidence but decreased rates of advanced disease due to mammography screening

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Background: In the period 1989–1997, a nation-wide mammography breast cancer screening programme for women aged 50–69 was implemented in the Netherlands. In this descriptive study, we analyze changes in breast cancer incidence and in tumour stage distribution in the 7 out of 9 regions in which no screening took place before 1990.

Methods: Annually, tabulated regional cancer registry data on breast cancer incidence and tumour stages were collected after linkage of records of screened women to the cancer registry. Based on population data from Statistics Netherlands, annual incidence rates were calculated for 3 age categories (40–49, 50–69 and 70–79), 3 cancer categories (screen-detected, interval cancer and breast cancers in not-screened women), and 6 tumour stages. The incidence rates are based on annual female population data from Statistics Netherlands and age-adjusted using the European standard population.

Results: In general, breast cancer incidence rates including DCIS rose strongly (14 to 42%) up to 1994, followed by a slight decrease or constant rates up to 1997, reflecting the change from predominantly prevalent screen examinations in the early nineties to predominantly incident screens after 1994. The proportion of screen-detected and interval cancers gradually increased: in 1997, 2 out of 8 breast cancers were screen-detected and one was an interval cancer; in women aged 50–69 these were 2 and 2, respectively. Incidence rates of small invasive cancers free from lymph node metastases (T1N0) showed the strongest increase, in particular in women aged 50–69. In this same age category, incidence rates of large and lymph node positive cancers (T2+N+) decreased by 13%.

Conclusion: Population-based breast cancer screening has a large impact on breast cancer incidence. In our study, the strong increase in incidence of in-situ and small invasive cancers went together with important decreasing incidence rates of advanced tumour stages.

114 POSTER HIGHLIGHT

Stereotactic vacuum-assisted breast biopsy (VB) in 2874 patients: a multicenter study

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Background: Vacuum assisted breast biopsy (VB) can replace surgical biopsy for diagnosis. We evaluated accuracy and clinical utility of VB in a multi-center setting according to a strict quality assurance protocol.

Material and methods: 2874 successful Mammotome(r)174;-VB were performed at five sites. Lesions were categorized as BI-RADS IV (85%), BI-RADS V (6%), and BI-RADS III (9%) lesions. 58% of lesions were <10 mm, 70% concerned microcalcifications. For malignancies and borderline lesions, surgery was recommended. Benign lesions were verified by follow-up.

Results: 7% invasive carcinomas, 15% ductal carcinoma in-situ (DCIS), 5% atypical ductal hyperplasias (ADH), and 0.6% lobular carcinoma in-situ were identified. Operative results necessitated an upgrade of 24% ADH to DCIS or DCIS and invasive carcinoma. 12% of DCIS patients proved to have invasive carcinoma. 73% of lesions were benign. Only a single false-negative result was encountered (negative predictive value, 99.95%). Minor side effects occurred in 1.4% of cases, 0.1% required a subsequent intervention. Scarring relevant for mammography was rare at 0.3%.

Conclusions: Quality-assured VB was highly reliable. VB effectively identified patients with benign lesions and assisted therapeutic decisions. Only a single case of malignancy was missed. A close interdisciplinary approach assures optimal results.

115 POSTER HIGHLIGHT

Use of intra-operative ultrasound to guide excision of impalpable breast lesions

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Purpose: The methods commonly utilized to guide surgical excision of impalpable breast lesions include preoperative placement of hookwires, carbon injections, and more recently radio-isotope injections. However, all of these techniques have disadvantages, not the least of which is the subjection of the patient to an additional stressful and often traumatic procedure preoperatively. The use of intraoperative ultrasound to guide the excision of sonographically visible impalpable lesions is a new technique which avoids the need for a preoperative localization procedure. This report describes the author's personal series of ultrasound guided breast excisions collating data collected prospectively and reviews the efficacy of this technique.

Methodology: Data in relation to 115 ultrasound guided breast excisions performed in 103 patients was reviewed. The technique of utilizing a high frequency real-time ultrasound probe intraoperatively to localize and guide excision breast abnormalities is described.

Results: There were no failed excisions as confirmed by specimen sonography, pathology findings and/or follow-up ultrasound. Breast malignancies comprised 42% of all excised lesions, and of these adequate margins of excision were achieved at the first operation in 93% of cases. Direct ultrasound localization of the lesion at the time of surgery allowed a more optimal placement of the incision and delays in theatre time were avoided as specimens did not have to be sent to the Radiology Department for confirmation of excision.

Conclusions: Intraoperative ultrasound guided excision is a safe and efficient technique in the management of impalpable sonographically breast visible lesions, and early reports in the world literature support the findings of this series which show it to have significant advantages over other current methods, particularly with respect to a reduction in patient anxiety and improved surgical resection margins.

116 POSTER

The variation of process indicators between ten Finnish screening centres in 1991–2000

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The aim of this study is to assess quality of the Finnish mammography programme by estimating the individual-level process indicators of ten breast cancer screening centres and to compare these centre-specific figures to each other and to the European standards. The centres invited over 1,000,000 mainly 50–64 years old women in 1991–2000. The mean compliance was 88%, and on average 2.8% of screened women were recalled for further assessment in each round. The average breast cancer detection rate was 0.38%. The centre-specific attendance rate varied from 84% to 92%, the recall rate from 1.2% to 4.3%, the surgical biopsy rate from 0.51% to 0.73%, the breast cancer detection rate from 0.32% to 0.47%, the positive predictive value (PPV) of mammography from 10% to 26%, and the PPV of biopsy from 47% to 77%. The differences in positive predictive values of mammography between the centres were statistically significant and relevant in practice. Irrespective of variability in the PPV, the relation between the detection rate and the expected breast cancer incidence rate was, however, on the recommended level in each of the centres. The average and centre-specific figures fulfilled mainly the quality assurance criteria of the European commission (2001). The wide variation by screening