Chapter 9

Recommendations

Research recommendations

Improving conventional mammography

The sensitivity and specificity of conventional mammography could be improved by conducting studies to explore:

- the relative sensitivity, specificity and cost–effectiveness of various approaches to double reading;
- the sensitivity, specificity and cost–effectiveness of computer-assisted reading and tactics to improve interpretation; and
- the effects of training film readers, of their experience and volume of practice and of peer evaluation.

Implementing mammographic screening programmes

A better understanding of factors affecting the acceptability, cost and implementation of mammographic screening programmes is needed. Studies should be conducted:

- in a variety of cultural settings to understand women's preferences for information and how best to communicate the harms and benefits of participation in mammographic screening;
- into the costs and benefits of initiating screening at various ages, particularly to evaluate the cost–effectiveness of starting screening of women at 45 years and stopping screening at 70 years; and
- to determine why some women with a suspect mammogram do not present for further evaluation for the presence of breast cancer.

Accuracy of mammographic screening

Research should be conducted on the effect of menopausal status, with or without hormone replacement therapy, on the accuracy of mammography.

Clinical breast examination

The efficacy and effectiveness of clinical breast examination in reducing mortality from breast cancer are unknown, and the trials in which clinical breast examination was combined with mammography cannot answer the question. A beneficial effect of clinical breast examination was suggested, however, in the Canadian comparison of mammography plus clinical breast examination with clinical breast examination alone, in which there appeared to be no additional benefit from the addition of mammography.

Clinical breast examination may be of particular importance in countries where there are insufficient resources for mammography and where disease is usually at an advanced stage at the time of diagnosis.

Many of these countries cannot afford mammography at all; others need evidence to allow them to decide whether to introduce mamography or clinical breast examination. Multi-country studies would be feasible in some regions of the world. Therefore:

- a randomized trial of clinical breast examination versus no screening should be conducted in a country or countries where resources are unlikely to permit implementation of mammographic screening in the foreseeable future, and
- a randomized trial of clinical breast examination versus mammography should be conducted in a country or countries where resources may permit some mammographic screening but are insufficient to cover the entire population at risk.

Breast self-examination

The efficacy of the practice of breast self-examination in reducing mortality from breast cancer is unproven. It is unlikely that teaching breast self-examination as the sole method for breast cancer screening would reduce mortality from this disease. It could, however, be a useful adjunct to screening by other means, by allowing detection of interval cancers earlier. Therefore:

- a randomized trial should be conducted of the efficacy of breast self-examination versus no breast self-examination in detecting interval cancers in women who receive periodic mammographic screening.

Consequences of diagnosis of breast cancer

By leading to earlier diagnosis of breast cancer, screening lengthens the period during which a woman lives with the knowledge that she has or has had cancer, whether ot not her life is actually lengthened as a result of the earlier diagnosis. To better understand the consequences of longer life with breast cancer:

- studies should be conducted to evaluate the psychological and physical consequences of living with a diagnosis of breast cancer and the sequelae of treatment for breast cancer.

Biology of breast tumours in relation to screening

The natural history of breast cancer and its relevance for screening programmes are not yet fully understood. Studies should therefore be conducted:

- to study the natural history of ductal carcinoma *in situ* of various grades;
- to evaluate the likely impact of detection and treatment of ductal carcinoma *in situ* on the incidence of invasive cancer;
- to improve differentiation of high-grade and low-grade ductal carcinoma *in situ* during reading of mammograms.

There is probably wide heterogeneity in the malignant potential of the many small invasive tumours detected by screening. Molecular and histological markers might be useful in classifying such small cancers according to their malignant potential and thus to allow treatment to be designed in accordance with the expected behaviour of the cancer. Therefore:

- rigorous studies should be done of the predictive value of combinations of histological and recent molecular markers for the behaviour and outcome of small invasive breast cancers; and
- measurement of promising markers should be included in clinical trials of treatment of small invasive breast cancers, to determine whether some categories of cancers defined by these markers could be treated less aggressively without loss of efficacy.

New techniques

Mammographic screening has imperfect sensitivity and specificity. The sensitivity, specificity and cost–effectiveness of new screening modalities should be compared with those of mammographic screening. Studies with rigorous designs should be conducted to evaluate:

- the effectiveness of new techniques, including magnetic resonance imaging, full-field digital mammography and positron emission tomography;
- the use of ultrasound as a screening modality in conjunction with mammography for women with dense breasts; and
- the usefulness of computer-assisted diagnosis in combination with full-field digital mammography: its impact on sensitivity and specificity, possible use as a 'second reader' and interaction with the 'experience' of film readers.

Women at high risk

The issues for high-risk women associated with participating in mammographic screening should be better understood. Mammographic screening has potentially adverse effects on women with a genetic predisposition to breast cancer. Studies should be conducted:

- to identify high-risk women, with a variety of methods for estimating risk, including family history, results of genetic tests, nipple aspirates and biological markers; and
- on the use of density and characteristics of calcifications and other initial mammographic images as sensitive markers for estimating future risk and adapting screening.

Public health recommendations

Information systems

Before establishing a new screening programme:

- Surveillance systems should be ideally available to provide estimates of incidence, morbidity, survival and mortality from breast cancer in the community and its impact on the health status of the population, and to allow follow-up to ensure that women are treated.
- Information systems should be in place to measure rates of participation, cancer detection, interval cancers and deaths from breast cancer. This can be done in the absence of a full cancer registry.
- Efforts should be made to establish standard approaches to reporting breast cancer by agreed protocols, including: stage of cancer, tumour size, histological grading and differentiation of both invasive and in-situ cancers.

Implementation of mammographic screening programmes

- Women should be given information about the potential harms and benefits of mammographic screening to enable them to make an informed decision about whether to participate.
- Mammography equipment should be monitored regularly and the radiation emitted minimized, while preserving the sensitivity to detect cancer.
- Screening programmes should be implemented, where possible, in a step-wise fashion, for example by introducing mammography in selected geographical areas or inviting women by birth cohort. This approach will help to circumscribe the scope of the programme in its early stages, ensuring that the available resources are not overwhelmed. In addition, it would provide a temporary control group for determining the effectiveness of the programme.