

E3. Breast cancer screening

Hans Junkermann

Mammography Screening Center Bremen, Germany

Screening for breast cancer has been shown to reduce breast cancer mortality by approximately 35% for participants in randomised studies [1]. Thus, screening has the largest overall effect of any intervention on the mortality from this frequent disease. Mammography is the only screening method that has been thoroughly evaluated and shown to have positive results. Several large randomised studies have proven the potential of this method. Doubts that had been raised about the validity of these studies [2] were refuted by an expert meeting organised by the International Agency for Research on Cancer (IARC) on behalf of the World Health Organisation (WHO) in March of 2002 [1]. Mammography is suitable for screening large populations. In Europe, it is usually restricted to women aged between 50 and 70 years. Organised population-based mammography screening has been introduced since the late 1980s in several European countries. In some of these countries, breast cancer mortality is going down in those cohorts that have been invited to screening [3–6]. Other countries are in the process of introducing screening or have (until now) only had regional programmes.

Because of the age dependent increase in the incidence of breast carcinoma, screening in young women (<40 years) can only be justified if an individual has a high risk for the development of malignant breast disease. This is the case in those women with a proven genetic defect in the *BRCA-1* or *BRCA-2* genes. Counselling of women who are suspected of being carriers of such genetic traits is supported by risk models which should separate high-risk from average-risk groups [7]. The optimal way to deal with an established genetic risk is not yet known. Alternatives include surgical prophylaxis, medical prophylaxis or intensified surveillance with high sensitivity techniques. In this respect, magnetic resonance imaging (MRI) shows promise [8,9], although there is not yet enough data showing that regular MRI surveillance lowers the mortality from breast cancer.

Mammography screening for breast cancer also has disadvantages and limitations, although these should be minimised in a quality assured programme. For instance, the sensitivity of detecting small carcinomas is reduced in women with radiologically-dense breasts. Ultrasound does not have this limitation. Further, a few systematic studies have shown that ultrasound, used as an adjunct to mammography, is able to detect a considerable number of

additional cancers [10,11]. However, it is not known how this is related to the cost-effective reduction of mortality. Mammographic densities seem to be related to breast cancer risk [12], but the reasons for this are not fully understood [13].

In a fraction of screened women, only pathological investigation is able to determine the benign or malignant nature of the lesion. The least invasive procedure is fine-needle aspiration. Today, this technique will be largely superseded by core-needle biopsy or vacuum biopsy, because these techniques are more standardised and, in some cases, also provide additional information on the lesion [14]. When MRI is used for screening or preoperative evaluation of tumour extent, methods for MRI-guidance of the sampling needle are necessary which puts special demands on the materials and techniques used.

If screening results in the detection of smaller tumours with a better prognosis, it is uncertain whether all of these tumours will need the same aggressive treatments that have been developed in the past to treat mainly clinically-detected tumours. An individualised treatment is the ‘goal of the future’ and many investigators are working to identify factors that will define these tumours that can be treated less aggressively without sacrificing the chance of a definite cure [15].

Mammographic screening for breast cancer is a well established method with a body of evidence and experience supporting it. The early detection and adequate treatment of the detected cancers poses a continuing challenge to all of the medical disciplines involved.

References

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