

MRI's high false positive rate has little impact on women's choice of preventive mastectomy

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Magnetic resonance imaging (MRI) falsely detects breast cancer in five out of every six positive scans according to new research into the use of MRI for women with a high, inherited risk of developing the disease. However, this high rate of false positives does not have a major impact on a woman's decision whether or not to have a prophylactic mastectomy.

The study, published today (Wednesday 26 March) in the April issue of the cancer journal, *Annals of Oncology*, also showed that MRI was very good at detecting genuine cases of invasive cancers and ductal carcinoma in situ (DCIS), a localised pre-cancer that can develop into invasive breast cancer, although the authors said that improvements in detection were still necessary.

The researchers from the Hereditary Cancer Clinic at Radboud University Nijmegen Medical Centre, Nijmegen, The Netherlands, followed 196 women with a BRCA1 or BRCA2 mutation, aged between 21 and 68 for an average of two years (a range of between one and nine years). Once the women had discovered that they carried a BRCA mutation (which gives a lifetime risk of breast cancer of up to 85 per cent and for ovarian cancer of up to 60 per cent) they made six-monthly visits to hospital to be examined by an experienced medical specialist and to have a mammography and, whenever possible, MRI. During their first surveillance visit, the researchers recorded whether the women had

a preference for ongoing surveillance, or prophylactic mastectomy and/or a prophylactic salpingo-oophorectomy (removal of fallopian tubes and ovaries).

During the period of the study, which ran from 1999 to 2005, 41 per cent (81 of 196) of the women had at least one positive MRI or mammogram; breast cancer was detected in 17 women (11 from scanning, four during prophylactic mastectomy and two during the interval between surveillance visits). The researchers found that the sensitivity of mammography (the proportion of true positives) was 41 per cent, for MRI it was 60 per cent and for the two combined it was 71 per cent. The specificity of the techniques (proportion of true negatives) was 93 per cent for mammography and 90 per cent for MRI or a combination of the two.

The lead author of the study, Dr Nicoline Hoogerbrugge, associate professor and head of the Hereditary Cancer Clinic, said: “When we looked at the positive MRI results, we found that 83 per cent of them could not be confirmed histologically and were, therefore, false positives: five out of every six positive MRI scans.”

The researchers also found that approximately six per cent of the BRCA mutation carriers who had normal findings from their clinical surveillance, mammograms and MRIs, and who underwent an intended prophylactic mastectomy, had an unsuspected malignancy. One was only four millimetres in size and it is known that MRI and mammograms have difficulty detecting lesions this small, but three were DCIS between six and 15mm. “This indicates that further improvement of early breast cancer detection is still necessary,” said Dr Hoogerbrugge.

When interviewed during their first surveillance visit, 58 women (30 per cent) expressed a preference for a prophylactic mastectomy. Three had no preference, and the rest preferred to have ongoing surveillance. After

some of these women had a positive scan, mastectomy was carried out in 90 per cent of those women who had expressed a preference for it, and in only 31 per cent of those who had preferred surveillance.

Dr Hoogerbrugge said: “During the first two years after the establishment of a BRCA mutation, four out of every ten female carriers were confronted with an abnormal MRI or mammography result, but this had a limited impact on their choice for prophylactic mastectomy. The final decision to actually undergo prophylactic mastectomy appeared to be determined more frequently by a woman’s prior preference than by a positive scan. Significantly more women with a prior preference for prophylactic mastectomy opted for it after a positive scan than did women without such prior intention. We found that women with a mother with breast cancer were more likely to have a preference for mastectomy.”

She said personal beliefs and the psychological impact of women’s family medical histories seemed to be of major importance in women’s decision-making process. “There are very few data available about how women decide upon prophylactic mastectomy. Both genetic counselling and breast cancer surveillance are events in the entire process of decision-making, but appear to have a limited impact.

“However, the fact that a false positive MRI result has little impact on a woman’s choice of prophylactic mastectomy may indicate that she has made a well-balanced decision on this subject.”

The researchers say that while the pros and cons of prophylactic mastectomy for BRCA mutation carriers remain controversial, with the effects on length and quality of life largely unknown, physicians should give detailed and unbiased information on the different treatments available and the breast cancer risk, including the number of malignancies that are not identified during breast cancer surveillance.

Dr Hoogerbrugge said: “It is important to give BRCA mutation carriers correct risk information for the decision process, because preventive surgery is irreversible.”

She concluded: “This study has made me realise that for women at high hereditary risk of breast cancer, accurate detection techniques are of the utmost importance, even at the cost of a high false positive rate because most women can cope with a false positive MRI result.”

Source: European Society for Medical Oncology

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