EDITORIALS

Benign Breast Disease — The Risks of Communicating Risk

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The term "risk" appears in the title of more than 10,000 medical articles published in 2004 (2 percent of the total) — nine times as many as appeared in 1975. In this issue of the *Journal*, the article by Hartmann et al. on benign breast disease and the risk of breast cancer[1] continues the trend, as does this editorial. Hartmann et al. studied a cohort of women who had a benign breast lesion and found that the histologic appearance of the initial biopsy specimen was associated with the risk of breast cancer. As compared with women in the general population, women with nonproliferative findings on breast biopsy had a relative risk of breast cancer of 1.27, those with proliferative changes but no atypia had a relative risk of 1.88, and those with atypical hyperplasia had a relative risk of 4.24. The effect of atypia on the risk of cancer seemed to be independent of a family history of breast cancer.

These data solidify what has long been known about the risk of breast cancer among women with benign breast disease[2,3] and help stratify women with a benign lesion into high-risk and low-risk groups. The information will be useful for a surprising number of women: within a decade of starting annual screening, approximately 20 percent of women in the United States will have undergone a breast biopsy[4]; most of these biopsies show no evidence of cancer.

Hartmann et al. studied a large cohort of women and used current definitions to review all cases, but their results are limited by the retrospectively gathered information on family history (presented for only 53 percent of the women) and the lack of data on breast density and other risk factors. Menopausal status, moreover, was derived mainly from the women's ages. Other variables that underlie both the likelihood of a biopsy and the increase in the rate of detection of breast cancer, such as a high level of concern about breast cancer and consequent frequent examinations when atypia is noted, will require consideration in future studies.

It is unclear whether an atypical histologic appearance is a precursor lesion or a marker of a general tendency to develop breast cancer. Only half of invasive breast cancers arise in the same breast in which atypical hyperplasia was previously diagnosed, suggesting that this lesion is a marker of generalized risk.[1,5]

Additional refinement of risk may come with the identification of molecular markers; in the meantime, reproducibility of findings among pathologists must be improved if we plan to base risk estimates on histologic findings.[5,6] Hartmann et al. provide no data on reproducibility, despite prior studies that have shown major disagreements in the assessment of atypia.[5,6]

How should clinicians communicate the risk of breast cancer and the implications of a benign breast lesion to women? Most of us, who cannot interpret numbers nearly as well as words, have difficulty understanding numerical expressions of risk.[7] In medical schools, courses in statistics usually do not go far enough in teaching statistical or probabilistic thinking, and few teach strategies for effective communication. Hence, most physicians are poorly equipped to discuss risk factors in a way that is readily comprehensible to their patients. This deficiency puts the ideal of informed consent in jeopardy.

Three simple techniques can be helpful.[7-11] First, have numerical risk data on hand while seeing patients; second, communicate risk in a clear way; and third, pay attention to positive and negative framing. Consider a woman who asks about her breast-cancer risk and, like most women, has had no prior breast biopsy. She is white and 45 years

old, had her first menstrual period at the age of 12 and delivered her first child after the age of 30, and has no first-degree relative with breast cancer. According to the Gail risk model, easily obtained on a Web site,[12] her risk of a diagnosis of breast cancer within the next five years is 1.1 percent. Her risk of not receiving a diagnosis of breast cancer within the same period is 98.9 percent. A more transparent formulation is that among 1000 women with these characteristics, 11 would receive a diagnosis of breast cancer within the next five years, whereas 989 would not. The woman should understand that this is a risk of diagnosis, not death, and that treatment has markedly improved over time.

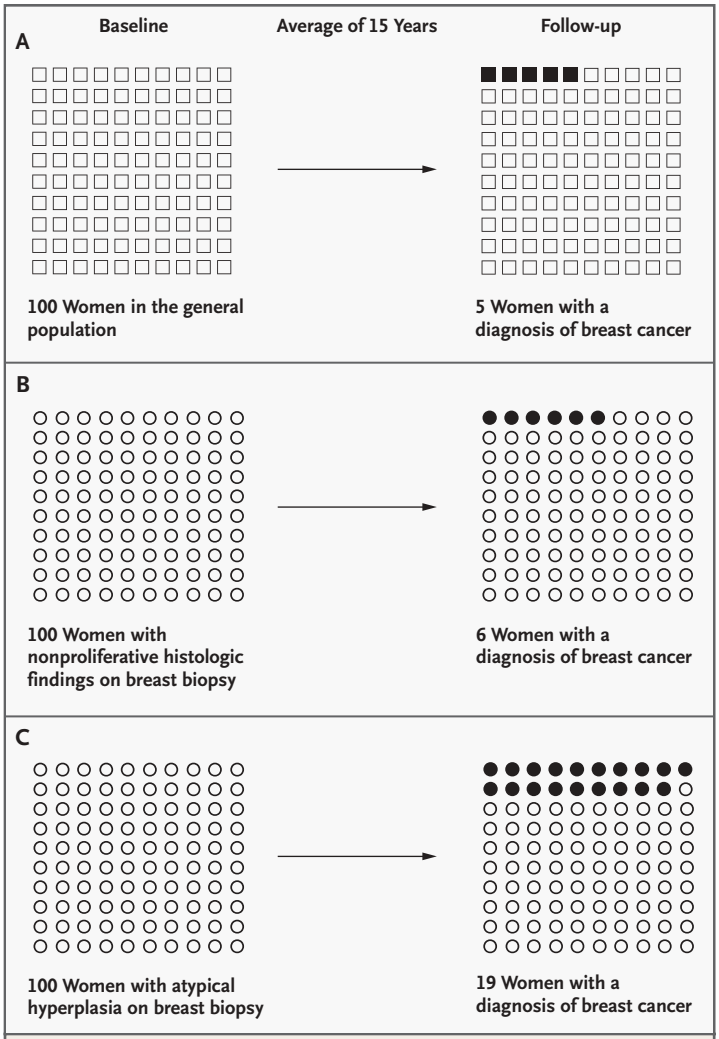

Figure 1. Examples of Outcomes among 100 Women Followed for an Average of 15 Years.

Each box represents a woman in the general population, and each circle represents a woman who has undergone a breast biopsy. The black circles and boxes represent women with a diagnosis of breast cancer after an average of 15 years of follow-up. In Panel A, 100 women in the general population are followed for an average of 15 years, and 5 subsequently receive a diagnosis of breast cancer. In Panel B, 100 women have nonproliferative findings on breast biopsy, and 6 subsequently receive a diagnosis of breast cancer. In Panel C, 100 women have atypical hyperplasia on breast biopsy, and 19 subsequently receive a diagnosis of breast cancer.

How can the results of the study by Hartmann et al. be explained to a woman with a benign breast lesion? They found that among 6061 women with nonproliferative disease, breast cancer developed in 379, as compared with an expected number of 297.7. This difference is reported as a relative risk of 1.27. The result can be communicated in terms of relative risks, which are misunderstood by many physicians and most patients, or absolute risks, which foster insight. Women with nonproliferative hyperplasia had a 27 percent increase in the risk of breast cancer in the ensuing 15 years. This is a relative risk and will most likely be misunderstood. Absolute risks are clearer (for simplicity, numbers are rounded): in the study by Hartmann et al., among 100 women in the general population, breast cancer developed in 5 within an average of 15 years of follow-up (Fig. 1A). Among 100 women with nonproliferative histologic findings, this number increased to approximately 6 (Fig. 1B). Thus, the increase in absolute risk is about 1 in 100. This is a simple way to describe the 27 percent increase in risk reported by Hartmann et al.

Women with proliferative disease but without atypia have an increase in the relative risk of breast cancer of 88 percent. Some women will falsely conclude that breast cancer will develop in 88 percent of such women. A more comprehensible way of communicating the same information is to say that among 100 women with this condition, the number in whom breast cancer will develop increases from 5 to about 10. Women with atypical hyperplasia have an increase in relative risk of 324 percent, equivalent to an increase in absolute risk from about 5 among 100 women in the general population to 19 among 100 women with atypical hyperplasia (compare Fig. 1A and Fig. 1C). The use of relative risks suggests greater effects than truly exist, whereas the use of absolute risks (or equivalent clear forms, such as the number needed to treat or the number needed to screen) prevents this misunderstanding. The use of relative risks should be avoided or employed in combination with more comprehensible forms of communicating risk.

Framing is the presentation of logically equiva-

lent information in different forms. Positive framing emphasizes the absence of disease; negative framing emphasizes the presence of disease. Expressing the absolute risk in a positive frame would lead us to say that among 100 women in the general population, breast cancer will not develop in 95 of them within the next 15 years (Fig. 1A); among 100 women with a biopsy revealing nonproliferative disease, 94 will not receive a diagnosis of breast cancer (Fig. 1B). People are sensitive to framing. Negative framing evokes a willingness to participate in a treatment or a screening, whereas positive framing may not.

Once information about risk is communicated, options for follow-up should be discussed (Table 1).[13,14] The recommended course of action is — and will remain for some time — annual mammographic screening with or without a clinical breast examination. If the woman wants to do more, she can perform breast self-examination, although this is no longer recommended by most expert groups. Annual screening with magnetic resonance imaging is not recommended for women whose only risk factor is benign breast disease. Genetic testing is recommended only for women with risk factors for *BRCA* mutations; it is unlikely to provide useful information for others. The risk of breast cancer among high-risk women can be decreased by chemoprevention and prophylactic surgery, though the potential harms need to be considered.

Informed decisions require that physicians know what the numbers mean and communicate them in ways that patients understand. Improving communication about risk is often treated as a "soft" topic, less important than improving forms of technology. But the best technology offers optimal results only when consumers understand its risks and benefits.[15]

Table 1. Options for Women at Increased Risk for Breast Cancer.

Option	Comment
Surveillance	Surveillance consists of annual mammography with or without clinical breast examination. Annual magnetic resonance imaging or ultrasonography is not recommended for women with benign breast disease.
Genetic testing	This approach is recommended only for women with risk factors for *BRCA* mutations and not for women whose only risk factor is atypia.
Chemoprevention*	Women at increased risk for breast cancer should be counseled about the potential benefits and harms of preventive therapy with a selective estrogen-receptor modulator. Increased risk has been defined as an age of more than 60 years, a 5-year risk of more than 1.66 percent as calculated with the use of the breast-cancer risk tool (available at http://www.cancer.gov/bcrisktool/), or a history of lobular carcinoma in situ. Chemoprevention is not recommended for women at low or average risk for breast cancer.
Prophylactic surgery	Mastectomy, bilateral salpingo-oophorectomy, or both may be an option for women at very high risk for breast cancer (e.g., those with genetic mutations).

* Recommendations for the chemoprevention of breast cancer have been provided by the U.S. Preventive Services Task Force.[13]

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