Breast Cancer - Hereditary Factors

Most cases of breast cancer occur by chance. However, breast cancer does occur more often than usual in some families because of their genetic make-up. Genetic means that the condition is passed on through families through special codes inside cells called genes. Your genetic 'makeup' is important because the material inherited from your parents controls various aspects of your body.

If you are concerned that your risk of developing breast cancer is higher than usual because of your family history then see your doctor for assessment.

If you have a moderately increased risk then an option is to have breast screening (mammography) at an earlier age than normal and more often than usual. If you have a high risk then you may be offered genetic testing, counselling and regular breast screening tests.

Some facts about breast cancer

- Breast cancer is one of the most common cancers in the world.
- In the UK about 1 in 8 women develop breast cancer at some stage of their lives.
- The biggest risk factor for developing breast cancer is increasing age. Most cases develop in women over the age of 50.
- Of women who do develop breast cancer, most do not have a strong family history of the disease. However, some women do come from families where breast cancer occurs more often than usual (see below).
- If breast cancer is detected in an early stage, there is a good chance of a cure. X-ray testing of the breast (mammography) can detect breast cancer at an early stage.

See separate leaflet called Breast Cancer for more details.

Breast cancer, genes and family history

The cause of breast cancer is probably a combination of factors. These include lifestyle factors, environmental factors, hormone factors and probably other unknown factors. Your genetic makeup is another factor which is known to be involved.

There are three genes that have been identified that may be faulty. The fault is also called a mutation. When they are faulty, they are particularly associated with breast cancer. These are the BRCA1, the BRCA2 and the TP53 gene mutations.

If you carry one or more of these mutations you have an increased risk of developing breast cancer (and certain other cancers such as ovarian cancer). Also, the cancer tends to develop at an earlier age than usual. These gene mutations are just the main ones so far identified which are related to breast cancer. There are probably others which cause a smaller increased risk which have not yet been identified.

About 1 in 20 women are likely to carry a faulty gene that gives them a higher risk than the general population of developing breast cancer. This may vary from a moderate increase in risk to a high risk. You inherit half of your genes from your mother and half of your genes from your father.
So, if you carry a faulty gene there is a 50:50 chance that you will pass it on to each child that you have. Because of these faulty genes, breast cancer does occur more often than usual in some families. This is sometimes called familial breast cancer or hereditary breast cancer.

Note: not all women with these faulty genes will develop breast cancer. It is just that the risk is increased.

Assessing your risk

As breast cancer is common, many of us will have a relative who has been diagnosed with breast cancer. This is not usually due to any of the faulty genes mentioned above but is more often by chance.

Most women with a family history of breast cancer do not have a greatly increased risk of developing breast cancer compared with the normal risk of the general population. However, some women are at greater risk than usual.

In general, your risk becomes greater:

- The more blood relatives you have who have been diagnosed with breast cancer.
- The closer the blood relationship to you of the person with breast cancer.
- The younger your relatives were when they were first diagnosed with breast cancer, especially if they were under the age of 40.
- If a relative had breast cancer which affected both breasts.
- If a male relative developed breast cancer.
- If both breast and ovarian cancer run in the family.
- If certain other uncommon cancers have developed in family members - for example, ovarian cancer, a sarcoma when under the age of 45, a glioma, or childhood adrenal cancer.
- If you come from certain ethnic backgrounds. As an example, the Ashkenazi Jewish community has a higher incidence of genes which increase the risk.

What should I do if I am concerned?

If you are concerned about a history of breast cancer in your family you should see your GP. They will want to take a family history. Before seeing your GP, it is a good idea to try to find out who in your family has been diagnosed with breast cancer (or other cancers), at what age they were diagnosed and their exact blood relationship to you.

Your GP will wish to know any relevant details about first- and second-degree relatives (from your father's side as well as from your mother's side).

- First-degree relatives are mother, father, daughters, sons, sisters, or brothers.
- Second-degree relatives are grandparents, grandchildren, aunts, uncles, nieces, nephews, half-sisters and half-brothers.

On the basis of the family history, it is usually possible for your GP to assess your risk as either near-normal, moderate, or high. If your risk is moderate or high then, if you wish, you may be referred to a doctor who is a specialist for further assessment and counselling.

For details of the factors used to assess the risk, see the website of the National Institute for Health and Care Excellence (NICE) - under references below. It has produced guidelines which doctors can refer to when assessing the risk of breast cancer for individual women.

If your risk is assessed as normal or near-normal

Most women have a normal or near-normal risk of developing breast cancer. That is about a 1 in 8 chance of developing breast cancer - most commonly after the age of 50. If your risk is normal or near-normal, you should still consider the usual advice to women. That is:

- Be breast aware. Get to know how your breasts normally look and feel, and report any changes promptly to a doctor.
Go for routine breast screening. All women in the UK aged between 50 and 70 are invited to have a routine mammography every three years. (This is being extended to 47-73 years but note this varies in the UK regions - see separate leaflet called Breast Screening for more details.) Mammography is an X-ray test that aims to detect breast cancer at an early stage when treatment is most likely to be curative.

Consider altering other factors which may affect your risk of breast cancer:

- If you are past the menopause and are overweight or obese, losing some weight will reduce your risk.
- Regular exercise reduces the risk.
- If you drink a lot of alcohol the risk is increased. Cutting back to sensible drinking is best if this applies to you.
- There is a slightly increased risk of developing breast cancer if you take the combined oral contraceptive pill (COCP) when you are aged over 35 years or hormone replacement therapy (HRT). If you use these, you may wish to consider other options.
- If you have children, women who breast-feed have a reduced risk of developing breast cancer compared with those who bottle-feed.

See your GP if there is a change in your family history. For example, if a close family member develops cancer of the breast or ovary after your risk of breast cancer has previously been assessed. This may mean that your risk has changed.

If your risk is assessed as moderate or high

Consider changing other risk factors for breast cancer as outlined above for women with normal or near-normal risk.

You will be offered a referral to see a doctor who is a specialist. He or she will make a detailed assessment of your risk on the basis of family history.

You may be offered genetic testing and counselling. This is usually done in a specialist genetics clinic. This may involve tests to see if you carry one or more of the faulty genes mentioned above. A blood test may also be taken from your family member who has breast cancer.

Depending on the outcome of the tests and assessment of the risk, some women are offered regular tests such as mammography or MRI scans for screening from an early age. The timing and frequency of any screening tests will depend on your own individual risk.

For a small number of women, whose risk is very high, surgery to remove the breasts and/or ovaries before cancer develops may be an option. This is not an option which is taken lightly and is only done after full risk assessment and counselling.

Several medicines (tamoxifen and raloxifene) have also been shown to reduce the risk of breast cancer in women who are at increased risk of the disease.

Further reading & references

- Familial breast cancer: classification, care and managing breast cancer and related risks in people with a family history of breast cancer; NICE Clinical Guideline (June 2013)
- BRCA in breast cancer: ESMO Clinical Practice Guidelines; European Society for Medical Oncology (2011)
- Breast cancer - managing FH; NICE CKS, December 2013 (UK access only)

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