

Breast cancer prevention

There are more than 40,000 new cases of breast cancer each year in the UK, with 13,000 deaths.

There are more than 2,300 new cases of breast cancer each year in the whole of Ireland, with just under 1,000 deaths.

Several studies have investigated the possibility that NSAID use, including the use of aspirin, may be associated with a reduced risk of breast cancer. Not all have shown an effect. The Nurses Health Study, conducted over many years in thousands of women, showed no association between NSAIDs and breast cancer risk, perhaps because many women allocated to no aspirin use may have taken it against instructions (1). Other studies have reported reductions in breast cancer risk among women using NSAIDs. The results are mixed, and not nearly as clear as those for the reduced risk of colon cancer among NSAID users. A meta-analysis of all the studies (6 cohort and 8 case control) found a combined relative risk (RR) of 0.82, (a reduction in risk of 18%) which was statistically significant (2). However, the available data were considered insufficient to estimate a dose-response effect for duration and frequency of use of any particular types of NSAID.

In November 2003 the Women's Health Initiative Study, a study of 80,741 women aged 50-79, suggested that regular use of aspirin or other NSAIDs may significantly reduce the risk of developing breast cancer (3). In women who had taken two or more tablets per week for 5-9 years, the risk was reduced by 21% (RR 0.79, CI_{95%} 0.60-1.04). In those regularly using an NSAID for 10 or more years the RR was 0.79 (CI 0.56-0.91). There was a highly significant trend showing that longer aspirin use was associated with fewer cases of breast cancer ($p < 0.01$). For ibuprofen the RR was 0.51 (CI 0.28-0.96). Neither paracetamol nor low-dose aspirin (under 100mg per day) had any effect on breast cancer risk. By contrast, a cohort study found that aspirin taken at cardioprophylactic doses, and paracetamol at analgesic doses, are associated with a reduced risk of breast cancer (4).

A case control study (1442 cases, 1420 controls) conducted during 1996-1997 reported an association between use of NSAIDs, including aspirin, and a lower risk of oestrogen-positive breast tumours (5). The risk reduction was greatest amongst those women who were frequent users of NSAIDs (≥ 7 tablets per week). (RR 0.72, CI_{95%} 0.58-0.90). This reduction was confined to women whose tumours were positive for oestrogen receptors (RR 0.74, CI 0.60-0.93) with no risk reduction in women with receptor-negative tumours (RR 0.97, CI 0.67-1.40).

These findings suggest that aspirin may reduce breast cancer risk by inhibiting the synthesis of oestrogen. One enzyme that may matter in breast cancer is aromatase. COX-2 induced prostaglandin production results in increased aromatase in human tumours. Aromatase converts androgens from adrenal glands into oestrogens which may themselves cause breast cancer. Blocking COX-2 with a COX inhibitor may therefore be helpful in preventing oestrogen-positive breast cancer.

There is conflicting evidence about the importance of duration of use. In one study, daily use over 10 or more years was associated with a more pronounced reduction in risk (6) but the Cancer Prevention Study II Nutrition Cohort found that even long-duration, regular use of aspirin or other NSAIDs was not associated with a reduction in breast cancer incidence in 77,413 women (7).

References:

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