Role of aspirin in cancer prevention

A review of the literature surrounding aspirin’s use in cancer prevention was recently published, utilising follow-up data from a number of systematic reviews and individual studies.

It is well established that aspirin at any dose can reduce the incidence of colorectal cancer (CRC). A 20-year follow-up of two high-dose aspirin randomised controlled trials (RCTs) showed an overall reduction in CRC incidence of 73% in participants scheduled on treatment for > 5 years, but the effect was seen only 10 years after randomisation. Similarly, long-term follow-up of three trials of aspirin at doses 75-300 mg/day showed a 25% reduction in CRC incidence but the effects were not apparent immediately and showed larger benefit with increasing duration of aspirin use. Two trials of alternate day aspirin use have not shown any reduction within 10 years of follow-up although a 43% reduction after 10 years was observed in the Women’s Health Study.

Evidence for mortality reduction in CRC is based on a greater number of studies, and the effect size appears to be larger, than for incidence: a 40% overall reduction in mortality which rises to 52% with at least five years of scheduled treatment on aspirin.

Effects from observational studies in CRC are largely consistent with those from RCTs, and tend to show larger reductions for standard or high dose aspirin compared with low dose aspirin. In individuals at high risk of CRC (carriers of Lynch syndrome) a RCT showed a 63% reduction in CRC incidence among those completing two years of treatment with aspirin 600 mg daily.

Although data are less extensive, consistent reductions in mortality have also been seen for oesophageal cancer: a 58% reduction after five years of follow up in RCTs has been observed. A 43% reduction in incidence of oesophageal cancer was seen in case-control studies; cohort studies reported a 27% reduction. Similar, although smaller, reductions of incidence and mortality are seen with stomach cancer, although the data are less extensive and more variable. Small effects are seen for breast cancer and prostate cancer, with non-significant reductions in mortality. Evidence for mortality reduction in lung cancer is variable but generally favourable.

There is consistent evidence that long term use of aspirin is necessary to achieve a cancer prevention benefit, although the optimum dose and duration are not fully defined and the benefits are primarily seen in malignancies of the gastrointestinal tract. While aspirin’s effects on cardiovascular mortality are only apparent during its time of administration, there is increasing evidence to suggest that aspirin’s effect on overall long-term mortality may relate to its effect in reducing cancer deaths.

However, aspirin use is associated with an age-dependent risk of bleeding (especially gastrointestinal bleeding in people older than 70 years of age) as well as peptic ulcer. The incidence of haemorrhagic stroke is increased by approximately 30% from a baseline of 0.03% per year.

In the recently published literature review, the authors’ ‘best estimates’ for individuals taking aspirin for 10 years give a relative reduction of 9% in the number of men and 7% in the number of women with a cancer, myocardial infarction or stroke over a 15-year period. Reductions in cancer incidence would account for 61-80% of the overall benefit and reductions in CRC alone would account for 30-36% of it. Major bleeding events would increase – depending on age and gender – by between 0.16% and 0.81% over their baseline rates of 0.57% to 2.37% over a 15 year period.

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