Clinical Studies of Aspirin and Cancer Prevention Signals

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Barry Kramer, M.D., M.P.H.
Division of Cancer Prevention
National Cancer Institute
Caveats

- Will only present the potential benefits
  - Not harms

- Most benefits are expressed as relative rates
  - Not in terms of absolute rate reduction

- The evidence presented is insufficient to make public policy or guidelines

- The U.S. Preventive Services Task Force is currently performing a systematic review of benefits and harms for cancer prevention
Daily Aspirin (≥ 5 yrs) Use and Colorectal Cancer Risk

- Randomized trials: Relative Risk 0.55, p=0.0005
- Case control: Relative Risk 0.63, p=0.004
- Standard cohort: Relative Risk 0.68, p=0.006
- Nested case-control: Relative Risk 0.51, p=0.012

Aspirin Use and Risk of Cancer (maximum reported use of aspirin)

Case-control studies (odds-ratio)

Cohort studies (risk ratio)

Algra & Rothwell.

Effect of Low-dose (75-300mg) Aspirin Vs Control on Colorectal Cancer Incidence & Mortality

Rothwell, *Lancet*, 20 November 2010

Data from 4 randomized trials of aspirin vs. control
Aspirin Use and Cancer Metastasis

Aspirin: HR 0.34 (95% CI 0.14–0.83), p=0.018
Control: HR 0.66 (95% CI 0.42–1.03), p=0.07

Number at risk:
Aspirin: 9919, 9670, 9317, 8824, 8076, 7286, 6032
Control: 7380, 7216, 6988, 6591, 5960, 5259, 4102
Daily Aspirin Use and Cancer Metastasis: (5 RCTs)

Aspirin at initial diagnosis (any metastasis)

- All solid cancers
  - Hazard Ratio: 0.73
  - p-value: 0.002
- Adenocarcinoma
  - Hazard Ratio: 0.60
  - p-value: 0.0001
- Non-adenocarcinoma
  - Hazard Ratio: 0.96
  - p-value: 0.81
- Colorectal cancer
  - Hazard Ratio: 0.26
  - p-value: 0.0008

Aspirin at initial diagnosis and remained on Aspirin

- Adenocarcinoma
  - Hazard Ratio: 0.31
  - p-value: 0.0009

Rothwell et al., Lancet 2012; 379: 1591–601
Aspirin (≥ 20 yrs) on Death Due to Cancer
(pooled 2° analysis from 3 RCT, n=10,502)

Rothwell et al., Lancet 2011; 377: 31-41
Key Points: Aspirin for Cancer Prevention

- Regular aspirin use is associated with reduction in the long-term risk of developing a variety of cancers [cohort, case-control & randomized clinical trials]

- Evidence strongest for GI cancers

- May reduce metastasis in patients taking aspirin prior to diagnosis of cancer [randomized trials]

- Need mechanistic studies of aspirin effects across the spectrum of pathogenesis, progression, and metastasis
Extra Slides
Maximum Opportunity to Interrupt Cancer Progression

Cancer Progression

Cancer Mortality
Metastasis
Cancer
Carcinoma in situ
Precancer
Normal

Cancer Prevention

Cancer Treatment

Survival without Cancer
Survival with Cancer

Umar et al., Nature Reviews Cancer 12, 835-848