Effects of daily aspirin on the development and progression of colorectal cancer

Lauren Heyne, Morgan Honza, Jeremiah Velasco, Julie Kutac, MA, PhD
The University of Texas Medical Branch, Galveston, Texas

utmb Health
Physician Assistant Studies

Objectives

- Investigate the use of aspirin in prevention of colorectal cancer.
- Discuss the role of aspirin as a potential neoadjuvant therapy for colorectal cancer.
- Discuss if the use of aspirin reduces mortality and morbidity in patients with known colorectal cancer.

Research Methods

- Research was conducted using the following: PubMed, Google Scholar and Ovid.
- Keywords searched included “aspirin”, “colorectal cancer”, “prevention”, “metastasis”, “survival”, “adjuvant therapy” and “mutations”.
- Parameters excluded in our searches included meta-analyses and systematic review study designs as well as research published before 2010.
- Twenty articles fit the inclusion criteria.

Background

History of Colorectal Cancer:

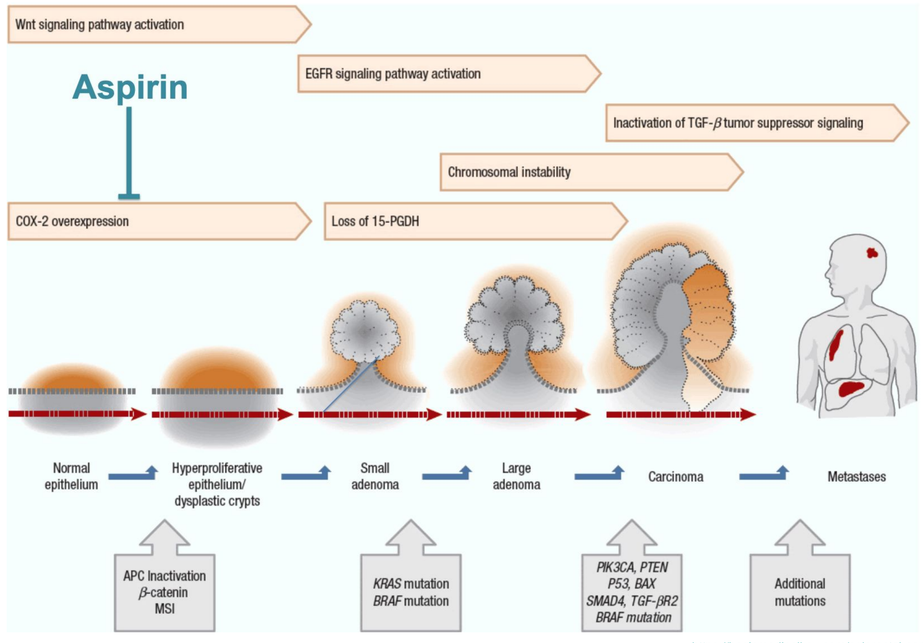
- Colorectal cancer (CRC) is the third most common cancer today.
- CRC is expected to remain in the top four cancer-related deaths due to high rate of metastasis.

The role of Aspirin in prevention of colorectal cancer:

- Aspirin is active in 2 pathways involved in polyp formation:
  - Activation of p38 mitogen-activated protein kinases → leading to cellular apoptosis.
  - Inhibition of nuclear factor kappa-b (NF-kb) → an important transcription factor regulating cellular proliferation.

Use of Aspirin in slowing metastasis and improving survival rate:

- Cyclooxygenase-2 (COX-2) is overexpressed in up to 85% of colorectal cancer cells leading to increased levels of matrix degrading metalloproteinase enzymes, important factors for basement membrane invasion.
- High levels of COX-2 leads to downstream production of prostaglandin E2, increasing angiogenesis for cancer cells.
- In early studies, COX inhibitors have been shown to slow tumor growth.



https://basicmedicalkey.com/colorectal-cancer-2/

Results

- Many trials have shown daily aspirin intake is associated with reduction in development of colorectal cancer.
- Studies showed that daily aspirin intake can reduce the mortality rate in patients with a confirmed diagnosis of colorectal cancer.
  - Aspirin’s effect on mortality rate does depend on the genetic profile of the tumor.
- Long-term aspirin use has been shown to reduce polyp (adenoma) sizes in the large bowel.
- Both low-dose aspirin (50-100 mg) and high-dose aspirin (325 mg) can reduce the risk of colorectal cancer

Conclusion

- Patients at risk for colorectal cancer benefit from daily prophylactic aspirin.
- Aspirin can reduce the reduce mortality and increase survival rates in patients with diagnosed colorectal cancer.
- Further clarification is needed in regards to optimal dosing of aspirin and duration of therapy with aspirin for prophylactic use versus therapeutic use in colorectal cancer.
- Further studies should be conducted to include the effects of aspirin on patients with specific genetic profiles.