Aspirin Use, Compliance, and Knowledge of Anticancer Effect in the Community

Gurpreet Singh Ranger, MD1,2; Cindy McKinley-Brown, RN1; Emma Rogerson1; Krystal Schimp-Manuel1

INTRODUCTION

Aspirin is used worldwide at low doses for secondary prevention of heart disease. There has been recent speculation regarding an additional role for aspirin: Chemoprevention of colorectal, breast, and other types of epithelial cancer. The cyclooxygenase (COX) enzyme system, and its 2 isoenzymes, COX-1 and COX-2, play a key role in prostaglandin synthesis in both health and disease. Excessive prostaglandin generation is thought to permit the progression of precursor epithelial lesions into cancers. Abnormal expression of COX-2 is considered to be a key event in cancer promotion. It is an inducible isozyme, expressed after stimulation by growth factors and tumor promoters, in turn generating uncontrolled prostaglandin release with all its negative sequelae.

Aspirin, a nonsteroidal anti-inflammatory drug (NSAID), inhibits the COX enzyme system at a low dose. Findings of randomized controlled trials have recently indicated that regular administration of aspirin for 5 years can reduce the risk of colorectal cancer up to 27%. Because millions of adults already use aspirin worldwide for the primary and secondary prevention of cardiovascular disease, considerable data already exist regarding its tolerability and side effect profile. Currently, there are patients who self-administer aspirin to reduce the risk of ischemic heart disease, perhaps partly because information regarding the anticancer effect of the drug has begun to emerge in the community. In these groups, aspirin might be a good candidate for chemoprevention. In healthy individuals, younger age groups, and patients not receiving any other medications, regular aspirin use would probably lead to an unacceptable increased risk of gastrointestinal tract bleeding and hemorrhagic stroke.

It is important to know how patients presently use aspirin in the community. Vital data include how many patients are using aspirin in the community. In these groups, aspirin might be a good candidate for chemoprevention. In healthy individuals, younger age groups, and patients not receiving any other medications, regular aspirin use would probably lead to an unacceptable increased risk of gastrointestinal tract bleeding and hemorrhagic stroke.

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ABSTRACT

Introduction: Millions of adults worldwide use low-dose aspirin for secondary prevention of heart disease. Results of randomized trials indicate that regular use of low-dose aspirin may reduce the risk of colorectal cancer by more than 20%, leading to speculation of its chemoprevention role for high-risk groups. Little is known, however, about the use of aspirin in our community.

Objective: To determine aspirin use and therapy compliance (never or rarely missing a dose) and to assess whether patients in our community are aware of its anticancer effect.

Methods: Observational study. Prospective data were collected during a 1-year period from patients in our general surgical clinic regarding aspirin use, comorbidities, adverse effects, and awareness of anticancer effect. Statistical analysis was performed.

Results: Among aspirin users (n = 137), the mean age was 65.8 years. Most (76.6%) received an 81-mg daily dose of aspirin. Compliance was 25.6% and was significantly associated with diabetes mellitus (p = 0.0028). Only 9.5% were aware of the medication’s anticancer effect. Among nonusers (n = 383), the mean age was 53.3 years, a significant difference vs that of aspirin users (p < 0.001). Only 4.7% of nonusers knew of the anticancer effect. Nonusers were more likely to be women (p = 0.0005), younger than age 40 years (p < 0.0001), and have comorbidities or polypharmacy (p = 0.002). No significant difference was found between groups in anticoagulants use, nonsteroidal anti-inflammatory drug use, and smoking.

Conclusion: Knowledge of aspirin’s anticancer effect is low. More research is required to understand why aspirin compliance is also low.
information. Concomitant use of other medications was recorded on a separate questionnaire given to all patients as part of hospital policy and was used to derive statistics for the number and the types of concurrent medications. Exclusion criteria included age younger than 18 years or older than 100 years. Patients were divided into 2 groups: Aspirin users and nonusers. All patients gave informed consent for the study.

Statistical analyses were performed with the unpaired t-test and the Fisher exact test using statistical software (SPSS version 16). The level of significance was set at 0.05.

RESULTS

Five hundred twenty patients were enrolled prospectively in the study. Allergy to aspirin or sensitivity was not disclosed by any patient. All patients were white. Table 1 shows the patients' characteristics by study group.

Aspirin Users

A total of 76.6% of patients were taking a daily aspirin dose of 81 mg; 5.8% of patients were taking a dose more than 300 mg; in 17.6%, the exact dose of aspirin being taken could not be determined. In fact, 32.9% of patients were not even aware of what dose of aspirin they were taking, although in some of these patients, the information was able to be determined from the medical record. Sixty-two percent of patients were taking aspirin on their physician's advice, and the rest were self-administering aspirin without a physician's recommendation.

Compliance with aspirin therapy was low, with 25.6% of patients stating they never or rarely missed a dose of aspirin. Another 39% admitted to missing doses weekly to monthly, and 3% never took aspirin despite it being prescribed. Less than 6% (5.8%) of patients taking aspirin reported adverse effects, including minor bruising, bleeding, or gastrointestinal upset. No serious complications were described.

Patients with diabetes mellitus were significantly more likely to be fully compliant with aspirin therapy compared with those without diabetes (p = 0.0028, Table 2). Age and sex were not significant factors in compliance.

Nonusers

Patients not using aspirin were significantly more likely to be women, younger than age 40 years, have ischemic heart disease, have diabetes, and/or use more than 5 concurrent medications (Table 3). No significant difference was found between the groups in anticoagulant use, additional NSAID use, or current smoking/history of smoking (Table 3).

Knowledge of Anticancer Effect

Knowledge of aspirin's anticancer effect was low in both groups, especially nonusers (Table 1). There might be some modest degree of evidence for knowledge of anticancer effect in the aspirin users group because the p value was near 0.05; however, this finding cannot be taken as significant. The main sources of information regarding the anticancer effect were media or the Internet.

DISCUSSION

Noncompliance occurs when patients do not follow recommended treatment plans. Underuse occurs when medications are used or prescribed less than would be expected. Compliance in our study was self-reported. Retrospective reporting can be inaccurate because patients may overestimate the degree of compliance with treatment. We relied on self-reporting because other ways of measuring compliance (eg, pill counting, measurement of serum levels) were not applicable to the design of our study and were logistically difficult to implement. Patient reporting, however, has been shown to be more accurate than clinician reporting. Physicians may exaggerate compliance or find it difficult to estimate, particularly with long-term treatment regimens.

In our study, 62% of the aspirin users were taking the medication under physician advice, probably for prevention of cardiovascular disease. The rest were self-administering aspirin. We did not explore reasons for aspirin use in this specific group, but with knowledge of the anticancer effect at only 9.5% in this group, it is possible that patients self-administered aspirin for cardiovascular reasons or perhaps for analgesia. We note that we did not specifically ask why patients were taking aspirin in our study, and this is perhaps a limitation of our work, because it may have given an insight into compliance.

Compliance was significantly associated with the presence of diabetes mellitus. Age and sex were not significantly associated with compliance. In our study, aspirin nonusers were significantly associated with age and presence of diabetes and cardiac

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<th>Table 1. Characteristics of aspirin users vs nonusers</th>
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<td>Characteristic</td>
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<tr>
<td>Men:women ratio</td>
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<td>Mean age (range), y</td>
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<td>Awareness of anticancer effect, %</td>
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<td>Aspirin users in past/ceased treatment, %</td>
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<td>NA = not applicable</td>
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<th>Table 2. Compliance with therapy in aspirin users group</th>
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<td>Factor</td>
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<td>Age</td>
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<td>Sex</td>
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<td>Diabetes mellitus</td>
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<td>Ischemic heart disease</td>
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<td>Use of &gt; 5 medications</td>
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* Fisher exact test.

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<th>Table 3. Significant differences of nonusers of aspirin versus aspirin users</th>
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<td>Characteristic</td>
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<td>Female sex</td>
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<td>Age &lt; 40 y</td>
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<tr>
<td>Ischemic heart disease</td>
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<td>Diabetes</td>
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<td>Use of &gt; 5 medications</td>
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<td>Smoker/ex-smoker</td>
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<td>Anticoagulant use</td>
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* Fisher exact test; nonusers compared with aspirin users.

NSAID = nonsteroidal anti-inflammatory drug.
Adverse effects can reduce compliance with most medications, but this effect is not as strong as others, including the physician–patient relationship. Low-dose aspirin is relatively well tolerated, reflected by the low incidence of adverse effects in our study (5.8%). Access to primary care and the physician–patient relationship could be key factors explaining noncompliance in our study. In patients using prescribed medications for psychiatric illness, 74% who form weak or poor alliances with their physician at 6 months fail to adhere to medication use during the following year and a half.

Understanding and memory of consultations can affect satisfaction with the encounter, which in turn affects compliance. Organizational factors, such as waiting time, comfort of seating, noncohesive staff, and inconvenient appointment times, are also relevant. Although physicians seldom attribute a patient’s noncompliance to their own communication style, there is evidence to demonstrate otherwise. The type of language used, quality of information given, and nature of the instructions to take the medication, all affect compliance.  

Nonadherence to a prescribed treatment may reflect an effort by the patient to restore control lost to the illness, its treatment, and an unsatisfactory physician–patient relationship. Teaching patients to gain control over their health issues can result in improved adherence. How patients perceive illness can affect compliance with using medication. In the context of a prevention strategy, a healthy patient may not see the benefit of taking medications daily because there is no immediate gain. In chronic disease with pervasive symptoms, another addition to a regimen that does little to improve ongoing quality of life may seem unnecessary. This coupled with unsatisfactory consultations can reduce compliance.

**Underuse of Aspirin**

Nonuse was significantly associated with women younger than age 40 years, the presence of ischemic heart disease or diabetes, and polypharmacy. Underuse of cardiac and other medications has previously been shown to be associated with older age, female sex, diabetes, and symptomatic cardiac disease or intervention. Other risk factors in these studies included ethnicity, being overweight, poor education, polypharmacy, and receiving dual antiplatelet therapy. Unfortunately, these groups are also representative of individuals who would derive the most benefit from primary or secondary prevention.

Women are less likely than men to be adherent in their long-term use of medications and less likely to receive the medication treatment and monitoring recommended by clinical guidelines. It has been indicated that an individual’s sex influences adherence. Women and men differ in their health beliefs and health behaviors and also may have different attitudes toward medications, with nonadherence appearing to be a more consistent phenomenon in women. On a population basis, women and men can differ in educational level, employment, income, and disease patterns. There is some evidence that women are more likely to obtain a prescription but then not fill it.

Previous studies have also found that adverse effects of medications can be a reason for nonadherence in women. Although women and men seem to report similar numbers of adverse effects, women use adverse effects as the reason for noncompliance almost twice as often as men. This might correlate to underuse of medications for prevention of disease, particularly if there is no immediate perceived benefit. Other studies have found that women have a higher risk for development of adverse effects with medication. It is possible they are more sensitive to drugs compared with men because of pharmacokinetic differences, wrong doses, or unsuitable medications more often than men.

The reasons for underuse of aspirin in our study population are likely to be multifactorial but are likely to include the same issues as with compliance. These reasons include problems in the nature of the physician–patient relationship, poor access to specialty care, poverty, lack of adequate health information, and lack of clear communication strategies for primary and secondary prevention in the physician’s office. In our community, these issues are common, and all have been shown to correlate with underuse in the aforementioned studies.

Interestingly, we found that polypharmacy was associated with nonuse
of aspirin. It has previously been shown that when patients take just 1 medication, nonadherence is around 15%; when 2 or 3 drugs are prescribed, nonadherence rates can increase to 25%, and with 5 or more medications, rates of nonadherence simply owing to drug error alone can be as high as 35%.24,46 It is not clear how this translates to underuse or nonuse from the patient’s point of view. It may be possible that in the context of polypharmacy and chronic disease, the less likely a patient will be to use another medication, even if recommended by his/her family physician, particularly in the absence of immediate benefit.45,46 This hypothesis requires further testing in a prospective enrolled study.

Knowledge of Anticancer Effect

There was an interesting hint in our study findings that patients using aspirin might be more aware of the anticancer effect of aspirin compared with nonusers. We would like to reaffirm that this was not a significant finding, as is true of the other instances in our study in which the value of p was near 0.05 and can therefore not be deemed significant, according to Wood et al.47

The anticancer effect of aspirin is well documented in the medical literature and has recently surfaced in the general media.48 It appears, however, this information has not yet translated into awareness at the physician-patient relationship. Previous studies found that although patients may seek health information from the Internet and various other sources, the quality of the physician-patient relationship is more valuable in terms of access to health knowledge.49 The various means of disseminating information in the modern era represent a potential opportunity for increasing patient education about the anticancer effect of aspirin.

CONCLUSION

For a strategy of chemoprevention of colorectal cancer with aspirin to be successful, the drug must be taken at the physician-recommended dose without fail, regularly, and long term. The risks of taking the medication must be lower than the perceived benefit.

Results of recent studies have suggested that the risk of major bleeding events with aspirin may be higher than previously considered and may equally balance or approach any cardiovascular benefit.50,51 Chemoprophylaxis seems to make sense in patients already prescribed aspirin for prevention of cardiac disease because a potential risk reduction of colorectal cancer of up to 27% might outweigh the percentage risks of adverse effects of aspirin. This decision would need a balanced discussion of harms vs benefits with the patient. Underuse and nonadherence to medications have substantial cost and health implications for society. We hope our results, taken in the context that they represent only our local community, will help inform clinicians of groups that are most vulnerable for noncompliance and underuse of aspirin and allow them to develop and target effective prevention strategies. In the future, we would like to examine knowledge of aspirin’s anticancer effect in patients in general, and in a wider physician population.

Disclosure Statement

The author(s) have no conflicts of interest to disclose.

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Kathleen Louden, ELS, of Louden Health Communications performed a primary copy edit.

Author Contributions

Gurpreet Singh Ranger, MD, conceived the study idea, designed the study and questionnaire, saw the patients, and drafted the final manuscript. Cindy McKinley-Brown, RN, statistically analyzed the data, and provided critical insight into the paper. Emma Rogerson helped review and submit the final manuscript. Krystal Schimp-McManuel distributed and organized the collection of the questionnaires. All authors have given final approval to the manuscript.

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References


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4. Pugh S, Thomas GA. Patients with adenomatous polyps and carcinomas have increased colorectal mucosal prostaglandin E2. Gut 1994 May;35(5):675-8. DOI: https://doi.org/10.1136/gut.35.5.675 PMID:8205564


