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Study of Aspirin in Primary Prevention

Gurubhej Singh Thakral[1]

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Abstract:

Cardiovascular diseases (CDV) and cancer represent the leading cause of morbidity and death worldwide. Prevention of these diseases is an essential for reducing the incidence of these conditions. Aspirin has a well-accepted role in prevention of cardiovascular diseases. In recent years some trials also suggested preventive effect of aspirin for various types of cancer. In developing countries aspirin is inexpensive and widely acceptable. Aspirin's anticlotting effect is useful for primary prevention because it potentially decreases the accumulation of blood clots that form as a result of reduced blood flow at atherosclerotic plaques, thereby reducing hypoxic damage to heart and brain tissue. The use of aspirin for cancer and cardiovascular diseases continue to be a source of major debate, with major international guidelines providing contradictory recommendations. Here, we review the evidence in favor and against aspirin therapy in primary prevention based on the evidence gathered so far, including recent data linking aspirin with cancer protection.

Keywords: *Aspirin, Primary Prevention, Diseases.*

Authors:

1. *Panjab University, Chandigarh, INDIA*

Introduction

At the end of 19th century a drug was derived from salicylic acid and has been used widely over the years as an analgesic, anti-inflammatory, and antipyretic agent. Aspirin or acetylsalicylic acid, is the acetylated version of the natural product and the aim is to improve the tolerability of the drug. It is the most widely drug used in medicine. In 2007, the Agency for Healthcare Research and Quality (AHRQ) reported that nearly 20% of adults in the United States reported taking aspirin daily or every other day, with this number increasing to nearly 50% in those aged 65 and older.

In certain subgroups of patients, e.g. patients with diabetes mellitus, with peripheral vascular disease, where the precise benefits have not been fully clarified aspirin is used. The secondary prevention benefits of aspirin treatment seems to outweigh the risks. In healthy individuals where the risk of thrombotic cardiac event, the role of primary prevention of aspirin is not clear. In primary prevention, number of current guidelines recommend the use of aspirin but do not fully consider the risk of bleeding.

Primary Prevention of Cardiovascular Diseases

In most developed countries the leading cause of death is dominant by the components of cardiovascular disease (CVD), of which coronary heart disease (CHD) and stroke. It is rapidly becoming the leading cause of death in the world. The World Health Organization estimates that annual global mortality due to CVD will approach 25 million by 2030, of which about 80 % will occur in developing countries.

For reducing the incidence of Cardiovascular diseases primary prevention represents a leading world strategy. Most medical science recommended the approach that modification of lifestyle, changes in environmental, and reduction of related risk factors decrease the incidence of these conditions. Based on the mechanism of action and prior medical benefits in secondary prevention the use of aspirin is widely studied.

Aspirin is a non-selective cyclo-oxygenase (COX) inhibitor which blocks the production of thromboxane in platelets so inhibiting their aggregation. But it also blocks the synthesis of prostaglandins in the vascular wall that, in health, causes vasorelaxation, maintains renal function, and reduces adhesion of platelets to the vessel wall. Because of its antiplatelet action aspirin may be beneficial for atherosclerosis, but also it shows a direct effect on the atheroma plaque. These properties of aspirin have consequently brought to explore the benefits of this drug in CVD prevention.

Primary Prevention for Cancer

The prophylactic aspirin focus on the possibility that it have a role in the primary prevention of cancer, especially colorectal cancer. To determine the role of aspirin in the prevention of cancer, the US National Cancer Institute states that research is ongoing and the US Preventive Services Task Force (USPSTF) recommends against the routine use of aspirin and non-steroidal anti-inflammatory drugs (NSAIDs) to prevent colorectal cancer in individuals at average risk. While the mechanisms underlying a potential chemo-preventive effect are unclear. It is important to know the risk of harmful effects when considering an intervention for primary prevention. The unwanted and harmful effects like bleeding and stomach pain can be seen as a result of taking aspirin.

Aspirin and Diabetes

Many studies on aspirin focused specifically on patients with diabetes. Individuals with diabetes have a 2–4 fold increased risk for serious developing cardiovascular events as a result of increased coronary thrombus formation, increased platelet reactivity, and worsened endothelial dysfunction than those of the same age and sex without diabetes. The two major contributors are atherosclerosis and vascular thrombosis which generally accepted that platelets are contributory. From men and women with diabetes Platelets are often hypersensitive in vitro to platelet aggregating agents. A major mechanism increased production of thromboxane, a potent vasoconstrictor and platelet aggregant. The thromboxane synthesis is blocked by aspirin by acetylating platelet cyclo-oxygenase and has been used as a primary and secondary strategy to prevent cardiovascular events in non-diabetic and diabetic individuals.

Review of Literature

Sawanyawisuth, *et al.* (2006) Aspirin therapy is useful for both primary and secondary prevention for cardiovascular events in diabetic patient. According to the research there was no serious side effects of the aspirin such as upper gastrointestinal bleeding. In the case of hypertensive patient aspirin is not a strong recommendation but after controlling the blood pressure aspirin therapy may be a beneficial.

Berardis, *et al.* (2010) Findings contrast with usual beliefs and existing summaries of evidence. In primary prevention of cardiovascular events they cannot recommend using aspirin for all patients. Benefit for primary prevention of major cardiovascular events or mortality in people with diabetes could not be identified in meta-analysis. Therefore in the risk of

reduction of major cardiac events no any type of significance is found with aspirin.

Kwok and loke, (2010) Aspirin has a significant benefits in a variety of clinical settings, but there are still uncertainties. Aspirin in primary prevention of cardiovascular disease, with diabetes mellitus, or with peripheral vascular disease is not supported by the current evidence. The benefits of aspirin use must be weighed clinically against the risk of adverse events such as gastrointestinal and intracranial bleeding.

Lei *et al.* (2010), for primary prevention aspirin is remain controversial. From the trail of meta-analysis indicates that both the healthy adults and patients with cardiovascular diseases will derive little protective benefit from aspirin considering the increased risk of severe bleeding events.

Yuxiang Dai and Junbo Ge, (2012) in primary prevention aspirin is used to reduce the risk for cardiovascular diseases. It may be considered for patient with a high risk of future CVD, but the benefit of aspirin must be weighed against the possibility of side effects. Aspirin is proven to be the basis of antiplatelet therapy in treatment and prevention of CVD in clinical trials in various populations.

John G.F. Cleland, (2013) there is no reliable evidence that aspirin used in the current fashionable doses of 50–100 mg/day is of any benefit in any common clinical setting. Aspirin prevents cardiovascular events by reducing the propagation of thrombus are countered by evidence that plaque haemorrhage from vasa vasorum may also cause plaque growth and instability.

Halvorsen, *et al*. (2014) Suggested that aspirin should be considered for the primary prevention of CVD in both sexes at a level of risk of major cardiovascular events. Recommendation of aspirin in the primary prevention of acute MI and other atherothrombotic cardiovascular events in subjects of both sexes is guided properly by an assessment of the cardiovascular risk.

Nansseu and Noubiap, (2015) study point out an increased risk of major gastrointestinal, extra cranial and intracranial bleeding with continuous aspirin therapy. The beneficial and adverse consequences of aspirin use in primary CVD prevention, providers and patients should routinely discuss aspirin use within the context of an overall strategy for CVD prevention that is tailored to the patient's CVD risk. This risk must be calculated, based on accurate and cost-benefit locally developed risk assessment tools, and adequate thresholds be defined.

Conclusion

The use of aspirin for the primary prevention of CVD in patients is attractive because the drug is widely available. In secondary prevention the benefit of aspirin is clear but in case of primary prevention the result is unclear. In fact, these review revisited point out an increased risk of major gastrointestinal, extra cranial and intracranial bleeding with continuous aspirin therapy. Therefore the pros and cons of aspirin should be carefully evaluated before the treatment. to examine aspirin benefits Further prospective studies are needed using other risk scores, the dose of aspirin associated with a better risk/benefit ratio, the influence of risk factors on aspirin efficacy and safety, and the role of aspirin resistance

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