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Use of Antiplatelet Therapy in Preventing Recurrent Cardiovascular Events in Patients with Previous Myocardial Infarction

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ABSTRACT

Background: The aim of this study was to evaluate the effectiveness of antiplatelet therapy in preventing recurrent cardiovascular events in patients with a history of myocardial infarction. Methods: A retrospective analysis was conducted on a cohort of 200 patients with previous myocardial infarction. Demographic information, medical history, medication details, laboratory values, and clinical outcomes were collected. Survival analysis techniques were used to assess the association between antiplatelet therapy and recurrent cardiovascular events. Results: The study population had a mean age of 62 years, with 70% being male. The majority of patients were Caucasian (75%). Antiplatelet therapy was prescribed to 80% of patients, primarily with aspirin as a single agent or in combination with an ADP receptor antagonist. The average duration of therapy was 12 months. During the follow-up period, 25 recurrent cardiovascular events were observed, with a cumulative incidence rate of 12.5%. Kaplan-Meier analysis demonstrated a significantly lower risk of recurrent events in patients receiving antiplatelet therapy compared to those without therapy ($p < 0.001$).Conclusion: Antiplatelet therapy, particularly aspirin-based regimens, demonstrated efficacy in preventing recurrent cardiovascular events in patients with previous myocardial infarction. These findings support the current guidelines recommending antiplatelet therapy as an essential component of secondary prevention strategies. However, careful consideration of bleeding risks is warranted. Larger-scale studies are needed to further investigate the comparative effectiveness and safety of different antiplatelet agents in this patient population.

INTRODUCTION

Cardiovascular disease remains one of the leading causes of morbidity and mortality worldwide, with myocardial infarction (MI) being a major contributor to this burden. Survivors of MI are at a heightened risk of experiencing recurrent cardiovascular events, including recurrent MI, stroke, and cardiovascular death. To mitigate this risk and improve patient outcomes, preventive strategies are of paramount importance. Antiplatelet therapy has emerged as a cornerstone in the secondary prevention of cardiovascular events in patients with previous myocardial infarction [1]. By inhibiting platelet activation and aggregation, antiplatelet agents effectively reduce the formation of thrombi and subsequent arterial occlusions. This approach has been shown to significantly decrease the risk of recurrent cardiovascular events and improve long-term prognosis in this high-risk population [2].

The mainstay of antiplatelet therapy in patients with previous myocardial infarction is the use of acetylsalicylic acid (ASA), commonly known as aspirin. Aspirin irreversibly inhibits the cyclooxygenase enzyme, thereby impeding the production of thromboxane A2, a potent platelet aggregator [3]. The effectiveness of aspirin in reducing the risk of recurrent cardiovascular events in this patient population has been extensively demonstrated in numerous clinical trials and forms the cornerstone of secondary prevention guidelines. However, emerging evidence has suggested that dual antiplatelet therapy (DAPT), combining aspirin with an adenosine diphosphate (ADP) receptor antagonist, such as clopidogrel, ticagrelor, or prasugrel, can further enhance the protective benefits. These agents target the P2Y12 receptor on platelets and provide a more potent antiplatelet effect compared to aspirin alone. Several large-scale trials have demonstrated that DAPT significantly reduces the risk of recurrent ischemic events when initiated early after myocardial infarction and continued for a prescribed duration. Despite the demonstrated benefits, the use of antiplatelet therapy in this setting is not without its drawbacks [4]. The most notable concern is the increased risk of bleeding associated with antiplatelet agents. Balancing the benefits of preventing recurrent cardiovascular events against the risk of bleeding complications poses a clinical challenge, particularly in patients who are at an increased bleeding risk or require concomitant anticoagulant therapy [5].

The use of antiplatelet therapy, primarily aspirin and/or dual antiplatelet therapy, plays a pivotal role in preventing recurrent cardiovascular events in patients with previous myocardial infarction. These agents effectively inhibit platelet activation and aggregation,

reducing the formation of thrombi and subsequent arterial occlusions. While the benefits of antiplatelet therapy are well-established, careful consideration of bleeding risk and individual patient factors is essential in optimizing treatment strategies. Future research and ongoing clinical trials continue to refine our understanding of the optimal duration and combination of antiplatelet agents, further enhancing secondary prevention strategies and improving outcomes for this high-risk population [6].

Objectives

The main objective of the study is to find the Use of antiplatelet therapy in preventing recurrent CV events in patients with previous myocardial infarction.

Material and methods

This retrospective study aimed to evaluate the use of antiplatelet therapy in preventing recurrent cardiovascular events in patients with previous myocardial infarction. A total of 200 patients who had experienced a myocardial infarction and were receiving antiplatelet therapy were included in the study.

Inclusion Criteria:

- Patients with a documented history of myocardial infarction.
- Patients who were prescribed antiplatelet therapy as part of their secondary prevention regimen.
- Patients aged 18 years or older.
- Availability of complete medical records and follow-up data during the study period.

Exclusion Criteria:

- Patients with a contraindication to antiplatelet therapy (e.g., allergy, active bleeding, or hemorrhagic stroke).
- Patients with a history of bleeding disorders or coagulopathies.
- Patients who had undergone coronary artery bypass grafting or percutaneous coronary intervention within the past three months.

- Patients with severe renal impairment (estimated glomerular filtration rate <30 mL/min/1.73 m^2) or end-stage renal disease requiring dialysis.
- Patients with a history of gastrointestinal ulcers or bleeding.
- Patients who were unable to provide informed consent or participate in follow-up visits.
- Pregnant or breastfeeding women.
- Patients participating in other clinical trials during the study period.

Data Collection:

Data for this study were obtained from medical records and electronic databases. Relevant demographic information, medical history, medication details, laboratory values, and follow-up data were collected for each patient. The study period encompassed a duration of three years.

Antiplatelet Therapy:

The antiplatelet therapy regimens were recorded for each patient, including the type of antiplatelet agent(s), dosage, and duration of therapy. The primary antiplatelet agent used in all patients was aspirin, with some patients receiving dual antiplatelet therapy (aspirin in combination with an ADP receptor antagonist) based on clinical indication.

Clinical Outcomes:

The primary outcome of interest was the occurrence of recurrent cardiovascular events, including myocardial infarction, stroke, and cardiovascular death. Secondary outcomes included bleeding events and adverse drug reactions associated with antiplatelet therapy.

Statistical Analysis:

Descriptive statistics were used to summarize the baseline characteristics of the patient population. The incidence rates of recurrent cardiovascular events, bleeding events, and adverse drug reactions were calculated. Kaplan-Meier survival curves were constructed to estimate the cumulative event-free survival rates. Cox regression analysis was performed to assess the association between antiplatelet therapy and the risk of recurrent cardiovascular events, adjusting for potential confounding factors.

Results

A total of 200 patients with a history of myocardial infarction were included in the study. The mean age of the study population was 62 years, with 70% being male and 30% female. The majority of patients were Caucasian (75%), followed by African American (15%), Hispanic (7%), and Asian (3%). The mean BMI was 28.5 kg/m². The most common comorbidities observed were hypertension (65%), dyslipidemia (58%), and diabetes mellitus (42%).

Table 1: Baseline characteristics of patients

Characteristic	**Frequency (%)**
Age (mean ± SD)	62 ± 8
Gender	
- Male	70%
- Female	30%
BMI (mean ± SD)	28.5 ± 3.2
Comorbidities (%)	
- Hypertension	65%
- Dyslipidemia	58%
- Diabetes Mellitus	42%

Antiplatelet Therapy:

Among the study population, 80% of patients were prescribed aspirin as a single antiplatelet agent, while the remaining 20% received dual antiplatelet therapy (aspirin plus an ADP receptor antagonist). Of those receiving dual therapy, 60% received clopidogrel, 25% received ticagrelor, and 15% received prasugrel. The average duration of antiplatelet therapy was 12 months, with variations based on individual patient characteristics and clinical factors.

Table 2: Antiplatelet therapy of selected patients

Antiplatelet Therapy	**Frequency (%)**
Aspirin	80%
Dual Antiplatelet	20%
- Aspirin + Clopidogrel	60%
- Aspirin + Ticagrelor	25%
- Aspirin + Prasugrel	15%
Average Duration (months)	12

Clinical Outcomes:

During the follow-up period, a total of 25 recurrent cardiovascular events were observed, including 10 cases of myocardial infarction, 8 strokes, and 7 cardiovascular deaths. The cumulative incidence rate of recurrent cardiovascular events was 12.5% over a median follow-up duration of 24 months. The incidence rate of bleeding events was 8%, with gastrointestinal bleeding being the most common type observed (5%).

Table 3: Clinical outcomes of selected patients

Clinical Outcome	**Number of Events**
Recurrent Cardiovascular Events	25
- Myocardial Infarction	10
- Stroke	8
- Cardiovascular Death	7
Bleeding Events	16
- Gastrointestinal Bleeding	10
- Other Bleeding Events	6

Survival Analysis:

Kaplan-Meier survival curves demonstrated that patients receiving antiplatelet therapy had a significantly lower risk of recurrent cardiovascular events compared to those not receiving therapy ($p < 0.001$). The estimated event-free survival rate at 2 years was 88% in the antiplatelet therapy group, while it was 72% in the untreated group.

Table 4: Survival analysis in patients

Group	**Estimated Event-Free Survival Rate at 2 Years**
Antiplatelet Therapy	88%
No Antiplatelet Therapy	72%

Cox Regression Analysis:

After adjusting for age, gender, comorbidities, and other potential confounders, the use of antiplatelet therapy was found to be independently associated with a reduced risk of recurrent cardiovascular events (hazard ratio: 0.45, 95% confidence interval: 0.25-0.80, $p = 0.007$). This association remained statistically significant even when considering the different types

of antiplatelet agents used. Adverse events related to antiplatelet therapy were reported in 15% of patients, with the most common being minor bleeding events, such as epistaxis or bruising. Severe bleeding events requiring medical intervention occurred in 2% of patients.

Table 5: Adverse events in selected patients

Adverse Event	**Frequency (%)**
Minor Bleeding Events	15%
Severe Bleeding Events	2%

DISCUSSION

The present study aimed to evaluate the use of antiplatelet therapy in preventing recurrent cardiovascular events in patients with previous myocardial infarction. Our findings demonstrate that antiplatelet therapy, particularly aspirin-based regimens, was associated with a significant reduction in the risk of recurrent cardiovascular events compared to no antiplatelet therapy [7]. These results contribute to the growing body of evidence supporting the use of antiplatelet therapy as a cornerstone of secondary prevention strategies in patients with a history of myocardial infarction [8].

The observed lower incidence of recurrent cardiovascular events among patients receiving antiplatelet therapy aligns with findings from previous studies. Our study adds to the existing literature by specifically focusing on a cohort of patients with previous myocardial infarction [9]. The significant association between antiplatelet therapy and reduced risk of recurrent events remained robust even after adjusting for potential confounders, suggesting that the observed benefit is independent of other factors known to influence cardiovascular outcomes [10].

The use of aspirin as the primary antiplatelet agent in the majority of patients reflects its established role in secondary prevention. Aspirin's antiplatelet effects, primarily through inhibition of thromboxane A2 synthesis, have been shown to reduce the incidence of major adverse cardiovascular events in patients with a history of myocardial infarction. The addition of ADP receptor antagonists, such as clopidogrel, ticagrelor, or prasugrel, in dual antiplatelet therapy further reduces the risk of thrombotic events, particularly in patients undergoing percutaneous coronary intervention [11]. Our study suggests that both single and dual antiplatelet therapy regimens were effective in preventing recurrent cardiovascular

events, although larger studies may be needed to explore potential differences in efficacy and safety among specific antiplatelet agents [12].

The incidence of bleeding events associated with antiplatelet therapy was relatively low in our study population, with most events being minor and manageable. Gastrointestinal bleeding was the most common type observed, consistent with the known adverse effects of antiplatelet agents on the gastrointestinal mucosa. These findings underscore the importance of balancing the benefits of antiplatelet therapy with the potential risks of bleeding complications in clinical decision-making [13].

CONCLUSION

In conclusion, our study provides evidence supporting the use of antiplatelet therapy in preventing recurrent cardiovascular events in patients with previous myocardial infarction. The findings demonstrate a significant reduction in the risk of recurrent events among patients receiving antiplatelet therapy, particularly aspirin-based regimens. This supports the current guidelines recommending antiplatelet therapy as an essential component of secondary prevention strategies in this patient population.

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