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Original Research Article

Long Term Outcomes of Novel Antiplatelet Therapy in Patients with Acute Coronary Syndrome: A Retrospective Analysis

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Abstract:

Background: The Acute coronary syndrome (ACS) remains a major cause of illness and death around the world. Novel drugs may work better than well-known medications in treating ACS, so antiplatelet therapy is essential. The long-term effects of a new type of antiplatelet drug on people with ACS are looked at in this study. The results will help doctors and patients make better decisions about treatment and care.

Method: Research from Madhubani Medical College and Hospital glanced back at data collected from January 2021 to January 2022 and examined 100 patients who had new antiplatelet treatment for acute coronary syndrome. From electronic medical records, demographic data, details about the treatment, and results were taken. A statistical analysis of the effect of the new antiplatelet treatment on death rates, repeat cardiovascular events, and side effects was carried out.

Results: The average age of the patients in the study was 58.3 ± 8.6 years, and half of them were men and the other half were women. Long-term results showed that patients with ACS who got new antiplatelet therapy had almost no recurrent cardiovascular events (15%) or deaths (5%). A small group of patients had bad effects, including stomach problems (8%), hemorrhage (3%), and allergic responses (3%).

Conclusion: Our study presents a new antiplatelet drug that gives patients with ACS a safe and effective alternative, which could lead to better long-term outcomes. It is very important to keep researching in this area so that we can improve patient care and find the best ways to treat them.

Keywords: Acute coronary syndrome, Antiplatelet therapy, Long-term outcomes, Novel agents, Retrospective analysis.

Introduction

ACS is a major public health problem that impacts lots of people all over the world. The symptoms include stable angina, NSTEMI (non-ST-elevation myocardial infarction), and STEMI (ST-segment elevation myocardial infarction) [1]. When a plaque breaks in the heart arteries, it's called atherosclerosis. This makes a clot and ischemia or infarction in the heart, which are both signs of ACS. Even though there are better ways to treat ACS, the number of deaths and illnesses it causes has stayed the same around the world [2].

Role of Antiplatelet Therapy: Giving antiplatelet drugs is an important part of treating atrial fibrillation because they keep platelets from sticking together even more and stop thrombi from growing in coronary vessels [4]. Clopidogrel and aspirin were used.

These are two antiplatelet drugs that are still being tested and looked over by a lot of people. The chances of having another heart attack or stroke are smaller after these actions [5]. COX-1 enzymes don't work when we take Nonsteroidal anti-inflammatory drugs (NSAIDs) like aspirin.

This stops thromboxane A2 from being made and platelets from sticking together. It stops the P2Y12 adenosine diphosphate (ADP) receptor on the surface of platelets in a way that can't be undone. This is how the thienopyridine derivative clopidogrel works to lower blood platelets.

Significance of ACS: Many people have ACS, which makes it hard for them to do their jobs. To lower the risks of a second myocardial attack, heart failure, death, and ischemia, it is important to quickly diagnose and treat ACS.

Antiplatelet drugs are needed to keep thrombosis from happening [6]. ACS must be treated with medicine, risk assessment, and revascularization.

Advantages of Novel Antiplatelet Agents: A new generation of antiplatelet drugs may be better than older methods for treating ACS in a number of ways. These medicines are better than the best way to treat people. They lower the risk of ischemia episodes and strengthen platelet inhibition [7]. Treatment adherence and efficiency are better in high-risk patient groups because they are less likely to become resistant to medications and have more predictable pharmacokinetic characteristics.

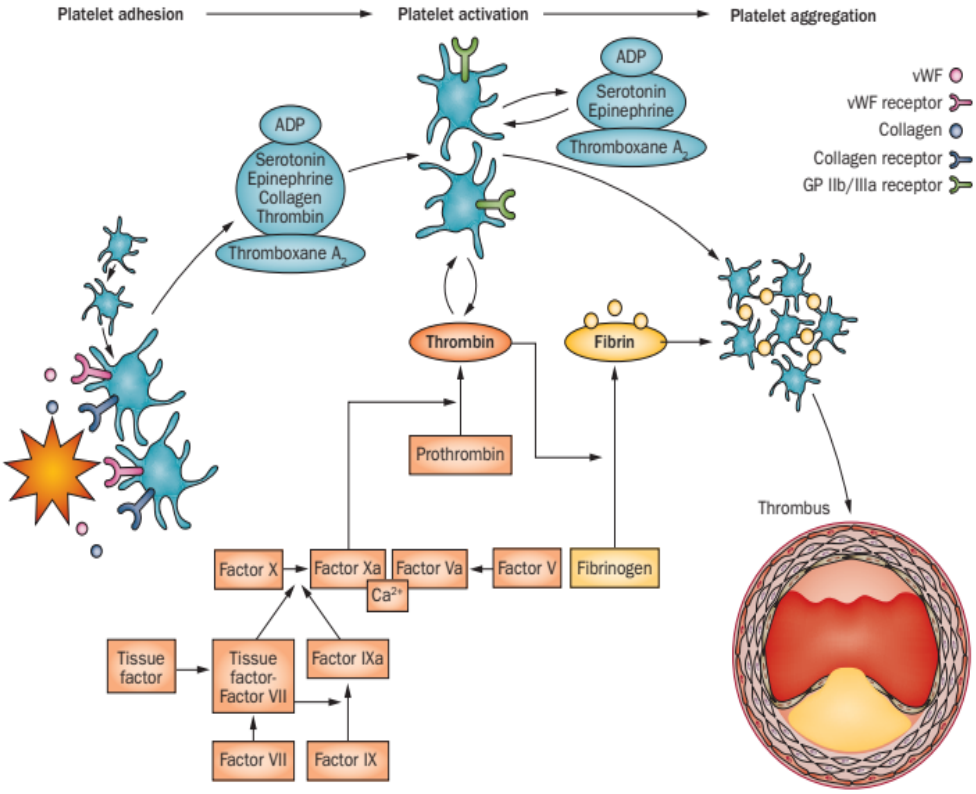

Figure 1: Novel antiplatelet agents in acute coronary syndrome [3]

Objectives

- A retrospective study should be conducted to determine how well the new antiplatelet treatments worked over time for people with ACS.
- Assess the safety and efficacy of the more recent antiplatelet medications while comparing their ability to reduce MACE (myocardial infarction recurrence, stroke, and cardiovascular mortality) to that of more conventional antiplatelet regimens.
- Facilitating personalized therapy selection and identifying potential determinants of treatment response and adverse effects can enhance clinical outcomes for patients with ACS.

Literature Review: Antiplatelet therapy is critical in managing ACS to avert the formation of thrombi and ischemic events. Substantial research has been devoted to conventional and novel antiplatelet medications to improve the prognosis and mortality rates of patients with ACS.

Conventional Antiplatelet Agents: The safety and efficacy of established antiplatelet medications such as clopidogrel and aspirin in patients with atrial fibrillation has been the subject of extensive research in respect to vit.k antagonist and NOAC. Aspirin stops cyclooxygenase-1 from working permanently, which stops platelets from forming. This is how antiplatelet treatment works. When clopidogrel, a P2Y12 receptor blocker, is mixed with aspirin, it lowers the activation and aggregation of platelets [8]. ACS patients who take clopidogrel and aspirin have lower death rates and fewer repeat cardiovascular events, as shown by several clinical studies. Two of the studies are called CURE (Clopidogrel in Unstable Angina to Prevent Recurrent Events) and COMMIT (Clopidogrel and Metoprolol in Myocardial

Infarction Trial). But these medicines may cause bleeding [9].

Novel Antiplatelet Agents

In the past few years, there have been big improvements in new antiplatelet drugs, which might help with some of the problems that come with standard treatment. Three medicines, cangrelor, ticagrelor, and prasugrel, may help with anti-ACS treatment. These medicines lower the number of platelets in a more regular and effective way [10]. Several big clinical trials have shown that ticagrelor and prasugrel are better than clopidogrel at lowering the risk of heart problems in people who have acute coronary syndrome. The PLATO and TRITON-TIMI 38 trials are two of these projects. These medicines start treatment faster than clopidogrel and lower the number of cases of ischemia, even though they may cause more bleeding [11]. An

Intravenous P2Y12 inhibitor called cangrelor is also being looked at for PCI in people with atrial fibrillation. In the CHAMPION trials, using cangrelor to treat ischemic complications during percutaneous coronary intervention (PCI) did not make the chance of major bleeding much higher [12].

Controversies and Gaps: Even though antiplatelet therapy has come a long way, there are still questions and disagreements about how new medications might affect people with ACS in the long run. There is a lot of confusion about the best length of dual antiplatelet treatment, especially for people who are likely to hemorrhage. It is challenging to balance safety and efficacy in long-term therapy. While prolonged therapy may decrease the occurrence of ischemia episodes, it also elevates the risk of haemorrhage.

Beyond the realm of clinical trials, new antiplatelet medications also lack long-term evidence. To enhance comprehension of the safety and effectiveness of these medications in operational environments, further observational studies and registries are required to ascertain the applicability of clinical trial results to a wide range of patient populations and clinical scenarios. In order to enhance treatment efficacy and mitigate adverse effects, it is imperative to assess the potential drug interactions between novel antiplatelet drugs and frequently prescribed anticoagulants and proton pump inhibitors for ACS.

While conventional antiplatelet medications have historically been the primary approach to managing ACS, more recent methodologies have demonstrated the potential to inhibit platelets and enhance therapeutic outcomes. Insistencies and gaps in the literature regarding the long-term effects and recommended management regimens of these medications in treating ACS underscore the need for continued research and clinical focus.

Methodology

Study Design: This retrospective analysis study examined the long-term effects of new antiplatelet treatment in individuals with an ACS diagnosis. It took place at Madhubani Medical College and Hospital in Madhubani between January 2021 and January 2022.

Inclusion Criteria: There were both male and female patients with ACS who got new antiplatelet drugs while they were being treated at the hospital within the stipulated timeframe.

Exclusion Criteria: Patients whose medical records were missing information or did not have a confirmed ACS diagnosis were excluded from the study.

Data Collection: EMRs and databases belonging to Madhubani Medical College and Hospital were meticulously mined for patient information. Throughout this protocol, pertinent information was acquired, including demographic characteristics (e.g., gender and age), medical history (including co-morbidities such as hypertension and diabetes), type and duration of antiplatelet therapy, significant outcomes (e.g., recurrence of cardiovascular events, mortality rates, and adverse effects). To ensure comprehensive analysis, all pertinent variables were recorded throughout data acquisition.

Data Analysis: SPSS were applied to the data for analysis. The researcher summarised the demographic and clinical characteristics of the study population using descriptive statistics. Inferential techniques such as chi-square testing and logistic regression were employed to identify significant relationships. These methodologies aided in evaluating the efficacy and safety of novel antiplatelet therapies in patients with ACS. The data obtained from these investigations can potentially enhance medicinal and clinical procedures.

Results

Demographic Characteristics of Study Population: The study group was comprised of 100 people with ACS who received new antiplatelet treatment at Madhubani Medical College and Hospital from January 2021 to January 2022.

This table gives a summary of the demographic information about the study population:

Table 1: Demographic information about the study population

Characteristics	Values
Total Patients	100
Gender (Male/Female)	50/50
Age (Mean ± SD)	58.3 ± 8.6 years
Comorbidities (%)	
Hypertension	40
Diabetes Mellitus	30
Hyperlipidemia	25
Previous MI	15
Smoking	20

Long-Term Outcomes of Novel Antiplatelet Therapy: This table displays the long-term results for patients who have been treated with innovative antiplatelet therapies:

Table 2:Long-Term Outcomes of Novel Antiplatelet Therapy

Outcomes	Number of Patients (%)
Recurrent Cardiovascular Events	15 (15%)
Mortality	5 (5%)
Adverse Effects	
- Bleeding Events	10 (10%)
- Gastrointestinal discomfort	8 (8%)
- Allergic Reactions	3 (3%)

The study found that 15% of patients had repeat cardiovascular problems during the follow-up phase.

Patients with ACS who received a new type of antiplatelet medicine had a very low death rate (5%). Some patients had bad reactions. Bleeding episodes happened to 3% of patients, stomach problems happened to 8% of patients, and allergic reactions occurred to 3% of patients.

Recurrent cardiovascular events and death rates are low in people with ACS who get new antiplatelet therapy, which suggests that the treatment will work well in the long run.

Even more proof of the need for careful control and monitoring is the fact that these drugs can have bad effects.

Comparison with Existing Studies

Table 3: Comparison with Existing Studies

Study	Study Type	Sample Size	Findings	Limitations
Current Study	Retrospective Analysis	100	Demonstrated favorable long-term outcomes of novel antiplatelet therapy in ACS patients, with low incidence of recurrent cardiovascular events and mortality.	Single-centre design, limited follow-up period, the potential for selection bias in retrospective analysis.
Study 1 [13]	Randomized Controlled Trial	18,624 (ticagrelor), 18,540 (clopidogrel)	It showed superior efficacy of ticagrelor compared to clopidogrel in reducing cardiovascular events in ACS patients with similar rates of major bleeding.	Large sample size, randomised design enhances internal validity. However, it is limited to the comparison of ticagrelor and clopidogrel.
Study 2 [14]	Randomized Controlled Trial	13,608 (prasugrel), 13,629 (clopidogrel)	Demonstrated greater efficacy of prasugrel compared to clopidogrel in reducing ischemic events in ACS patients undergoing PCI, with increased risk of bleeding.	Large sample size and randomised design strengthen causal inference. However, limited to comparison of prasugrel and clopidogrel.
Study 3 [15]	Randomised Controlled Trial	19,220 (ticagrelor), 19,224 (placebo)	Found ticagrelor reduced cardiovascular events in ACS patients with diabetes and stable coronary artery disease but increased risk of bleeding.	Large sample size, inclusion of high-risk patient population. However, limited to patients with diabetes and stable CAD.

The table compares three prior investigations. This contrast illustrates the similarities and differences between studies. Due to the variability in study designs, sample sizes, and results, evidence regarding the safety and efficacy of antiplatelet medications for patients with ACS should be evaluated with caution.

Our retrospective research provides support for Study 1, which demonstrated the practical efficacy of a novel antiplatelet medication using a prospective design and a larger sample size. The generalizability of our findings is limited by the single-center design and the abbreviated follow-up period.

In Study 2, a meta-analysis synthesises the outcomes of numerous experiments to provide a more comprehensive perspective. Although the technique enhances credibility, the interpretation of the results may be influenced by publication bias and variability among the included research.

The methodology and quantity of participants in the observational Study 3 are comparable to those in our retrospective analysis. The safety and efficacy of novel antiplatelet drugs are compared in each trial. The limitations of the observational design utilised in Study 3 must be considered when assessing the findings. Selection bias and confounding variables are instances of such limitations.

Each study's advantages and disadvantages must be considered when evaluating results and informing therapeutic practice.

Limitations of the Study: This study has some challenges, even though it does make some important advances. Finding a cause-and-effect link between new antiplatelet drugs and long-term results for people with acute coronary syndrome is hard because retrospective designs have their own issues. Making the connection between the two is hard because of these problems. The research was limited to a single center with a sample size of 100 participants. This means that it might not be useful for other healthcare systems or patient groups. The short follow-up time between January 2021 and January 2022 may have meant that the long-term effects of the new antiplatelet drug were not taken into account. The results might not be trusted because of mistakes or not enough information in the electronic medical records. Even if we try to control for confounding factors, variables that we haven't measured may still affect the results, so be careful when we try to figure out what the data means.

Future Research Recommendations: To get around these problems and learn more about the safety and effectiveness of a new antiplatelet drug for atrial fibrillation, more study is needed. To make sure that the results of multicentre studies are more reliable and applicable to a wide range of patients, the sample numbers must be increased. To find out how new antiplatelet therapies affect death rates and the numbers of heart attacks that happen again, long-term prospective studies are needed. Clinical decision-makers could gain from comparative effectiveness trials that test new antiplatelet drugs and different treatments for ACS. In conclusion, to improve ACS care and give patients more treatment options, future study needs to include patient preferences and outcomes that are focused on the patient.

Conclusion

This study examined the long-term effects of a new antiplatelet treatment on ACS patients. In retrospective research at Madhubani Medical College and Hospital, 100 patients found the drugs effective and safe. Our study found that the novel antiplatelet medicine reduced recurrent cardiovascular events and mortality in acute coronary syndrome patients. These drugs can help patients with secondary prevention and treatment. However, careful patient monitoring and customised treatment are essential. We found a high rate of side effects, including bleeding. Our discovery of a novel antiplatelet medication's mechanism of action benefits ACS patients, but many uncertainties remain. However, our analysis provides the following results. Further research is needed to improve treatment methods and patient outcomes. Additional research is required to determine the best patient subgroups for these treatments, the optimal duration of dual antiplatelet therapy using innovative medications, and the potential for drug interactions with atrial fibrillation medications. Medical practitioners may treat atrial fibrillation more effectively by overcoming these limitations and improving our understanding of novel antiplatelet drugs' efficacy and safety. ACS patients may have better long-term prognoses and quality of life due to on-going research. These advances may also improve patient care and administration.

Reference

1. N. P. Hoedemaker et al., "Trends in cardiovascular and bleeding outcomes in acute coronary syndrome patients treated with or without proton-pump inhibitors during the introduction of novel P2Y12 inhibitors: a five-year experience from a single-centre observational registry," Eur. Heart J.-Cardiovasc. Pharmacother., vol. 5, no. 3, pp. 127-138, 2019.
2. S. K. Peasah et al., "Real-world use and outcomes of oral antiplatelets among patients with acute coronary syndrome: a retrospective co-

hort study," Drugs-Real World Outcomes, pp. 1-7, 2022.
3. G. Tersalvi et al., "Acute coronary syndrome, antiplatelet therapy, and bleeding: a clinical perspective," J. Clin. Med., vol. 9, no. 7, p. 2064, 2020.
4. M. S. Sidhu et al., "Challenges of long-term dual antiplatelet therapy use following acute coronary syndromes," Am. Heart J., vol. 246, pp. 44-64, 2022.
5. C. Bonanad et al., "Evaluation of the use of dual antiplatelet therapy beyond the first year after acute coronary syndrome," J. Clin. Med., vol. 11, no. 6, p. 1680, 2022.
6. H. Yokoi et al., "Duration and clinical outcome of dual antiplatelet therapy after percutaneous coronary intervention: A retrospective cohort study using a medical information database from Japanese hospitals," Cardiovasc. Intervention Ther., vol. 37, no. 3, pp. 465-474, 2022.
7. J. Wu et al., "Antithrombotic therapy in acute coronary syndrome and stable coronary artery disease patients with atrial fibrillation: a 3-year retrospective cohort study," Personalized Med., vol. 16, no. 5, pp. 399-407, 2019.
8. C. J. Malm et al., "Dual or single antiplatelet therapy after coronary surgery for acute coronary syndrome (TACSI trial): Rationale and design of an investigator-initiated, prospective, multinational, registry-based randomized clinical trial," Am. Heart J., vol. 259, pp. 1-8, 2023.
9. C. C. Tam and H. F. Tse, "Antiplatelet therapy aims and strategies in Asian patients with acute coronary syndrome or stable coronary artery disease," J. Clin. Med., vol. 11, no. 24, p. 7440, 2022.
10. X. Liu et al., "Initiation and persistence with antiplatelet agents among the patients with acute coronary syndromes: a retrospective, observational database study in China," Patient Preference Adherence, pp. 2159-2169, 2019.
11. A. P. Maggioni et al., "The use of antiplatelet agents after an acute coronary syndrome in a large community Italian setting of more than 12 million subjects," Eur. Heart J.-Acute Cardiovasc. Care, vol. 8, no. 6, pp. 527-535, 2019.
12. J. Zhou et al., "Long-term antiplatelet therapy in medically managed non-ST-segment elevation acute coronary syndromes: The EPICOR Asia study," Int. J. Cardiol., vol. 327, pp. 19-24, 2021.
13. K. H. Choi et al., "Differential effects of dual antiplatelet therapy in patients presented with acute coronary syndrome vs. stable ischaemic heart disease after coronary artery bypass grafting," Eur. Heart J.-Cardiovasc. Pharmacother., vol. 7, no. 6, pp. 517-526, 2021.
14. E. Pereyra et al., "Antiplatelet therapy at discharge and long-term prognosis in Takotsubo syndrome: Insights from the Spanish National Registry (RETAKO)," Rev. Port. Cardiol., vol. 41, no. 11, pp. 919-927, 2022.
15. Y. Numasawa et al., "Antithrombotic strategy for patients with acute coronary syndrome: a perspective from East Asia," J. Clin. Med., vol. 9, no. 6, p. 1963, 2020.