Original Article

Patients Adherence to Dual Antiplatelet after Percutaneous Coronary Intervention with Drug Eluting Stent Covered by Government Insurance (Sehat Card Plus Program)- An Experience from a Large Tertiary Care Cardiac Center in a Low to Middle Income Country

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ABSTRACT

Background: Percutaneous coronary intervention (PCI) is a critical procedure for patients with coronary artery disease. Ensuring adherence to dual antiplatelet therapy (DAPT) post-PCI is essential for optimal patient outcomes. This study explores the impact of DAPT adherence on patient health and mortality rates in a hospital setting.

Objective: To investigate the outcomes associated with patient adherence to DAPT following PCI.

Methods: This cross-sectional study enrolled 502 PCI patients at the Peshawar Institute of Cardiology from November 2022 to October 2023. All patients were prescribed DAPT and followed up 7 months post-PCI. Data were collected using a pre-designed questionnaire and analyzed with SPSS Version 25.

Results: The study enrolled 502 patients with a mean age of 60.19 ± 10.01 years. Among them, 66.5% (334) were male, and 33.5% (168) were female. Adherence to DAPT was 100%, with a mortality rate of 0.2% (1 patient). All patients were educated. The prevalence rates for diabetes mellitus, hypertension, and tobacco use were 19.9% (100 patients), 35.1% (176 patients), and 8.6% (43 patients), respectively.

Conclusion: The study concluded that high adherence to DAPT post-PCI is significantly associated with improved patient health and a low mortality rate.

Keywords: Cardiology, Compliance, Coronary Artery Disease, Dual Antiplatelet Therapy, Mortality, Percutaneous Coronary Intervention, Patient Outcomes.

INTRODUCTION

Dual antiplatelet therapy (DAPT) is a standard treatment following percutaneous coronary intervention (PCI), a common procedure to open narrowed or blocked coronary arteries. The purpose of DAPT is to prevent blood clotting on the stent and reduce the risk of complications such as stent thrombosis and recurrent cardiovascular events. The ideal length of DAPT after PCI remains a topic of debate (1). For individuals diagnosed with coronary artery disease (CAD), PCI is a fundamental aspect of managing acute coronary syndrome (ACS) cases. Additionally, PCI has become widely accepted for patients experiencing chronic coronary syndromes (CCS) (2). Patients undergoing PCI may encounter both acute and prolonged ischemic events (3). Therefore, antithrombotic medications, especially antiplatelet agents, are crucial in managing and preventing both local and systemic thrombotic complications (4, 5).

The American College of Cardiology (ACC), the American Heart Association (AHA), and the European Society of Cardiology (ESC) have provided guidelines on the duration of DAPT after PCI. These guidelines generally recommend a minimum duration of DAPT, typically 6 to 12 months, following the implantation of drug-eluting stents (DES). The duration may be shorter for bare-metal stents.

Oral antiplatelet agents are vital in managing both short- and long-term outcomes following PCI. As an irreversible inhibitor of platelet cyclooxygenase (COX)-1, aspirin has historically been a cornerstone treatment for individuals with manifestations of

atherosclerotic disease (6). In the context of PCI, the combination of aspirin with a P2Y12 inhibitor, forming DAPT, has consistently been the primary approach for treating patients undergoing this intervention (4, 5). The choice of P2Y12 inhibitor and the duration of DAPT can be influenced by factors such as the type of stent used, the patient's bleeding risk, and the presence of other comorbidities. Compliance with DAPT is essential for individuals who have undergone PCI, especially with the use of drug-eluting stents. DAPT commonly includes aspirin along with a P2Y12 receptor inhibitor (such as clopidogrel, prasugrel, or ticagrelor) and is prescribed to prevent stent thrombosis and minimize the risk of major adverse cardiovascular events (MACE) following PCI. For individuals diagnosed with chronic coronary syndrome, the 2016 update from the American College of Cardiology and the American Heart Association suggests DAPT, involving both aspirin and a P2Y12 inhibitor, for a period of 6 months following PCI with a drug-eluting stent (DES). There is a possibility to extend the duration of DAPT for individuals who do not experience bleeding complications during this initial 6-month period and are not at high risk of bleeding (7).

MATERIAL AND METHODS

This cross-sectional study was conducted at the Peshawar Institute of Cardiology, Pakistan, over a one-year period from November 2022 to October 2023, following approval from the hospital's ethical committee. The research focused on patients who had undergone percutaneous coronary intervention (PCI) and were prescribed a dual antiplatelet therapy regimen, typically comprising aspirin and a P2Y12 inhibitor such as ticagrelor. In addition, statins were also prescribed as part of the treatment plan.

Inclusion criteria for the study were: patients who underwent PCI; those prescribed dual antiplatelet therapy at discharge; confirmed diagnosis of coronary artery disease (CAD) or acute coronary syndrome (ACS); absence of bleeding disorders that contraindicate dual antiplatelet therapy; and an age range of 18 to 80 years, encompassing both genders. Exclusion criteria included patients with a history of allergy or intolerance to dual antiplatelet agents, those with planned non-cardiac surgery in the near future, and pregnant or breastfeeding individuals.

A comprehensive clinical examination was performed for all eligible patients. Adherence to the prescribed medication was a key focus of this study. Adherence during the previous month was defined as the consistent and regular intake of any prescribed antiplatelet medication (aspirin, clopidogrel, ticlopidine, etc.) within the month following their coronary intervention and after discharge from the hospital. Conversely, 'nonadherence' was characterized as the failure to take, or forgetting to take, any kind of prescribed antiplatelet medication at least once in the month prior to their follow-up examination. All patients were followed up at the 7th month post-PCI.

For data collection, a pre-designed questionnaire was used to capture pertinent information. The statistical analysis of the collected data was conducted using SPSS Version 25. This methodology ensured a comprehensive and systematic approach to understanding patient adherence to dual antiplatelet therapy in the context of the specific healthcare setting and population demographics.

RESULTS

The mean age of the enrolled patients was 60.19 ± 10.01 years (Table 1). Of these patients, 334 (66.5%) were male and 168 (33.5%) were female (Table 2, Fig 1). Compliance with dual antiplatelet therapy was observed in 100.0% of the patients. The mortality rate was 1 (0.2%). Additionally, 100.0% of the patients had received some form of education. It was found that 100 (19.9%) patients had diabetes mellitus (DM), 176 (35.1%) had hypertension, and 43 (8.6%) used tobacco (Table 2, Fig 3).

Table 1: Mean age of all enrolled Patient (n=502)

Variables	Mean±SD
Age (Years)	60.19±10.01

Table 2: characteristic of all the enrolled patients (n=502)

Variables	Frequency	Percentage
Gender		
Male	334	66.5
Female	168	33.5
Diabetic Mellitus		
YES	100	19.9
NO	402	80.1
Hypertension		

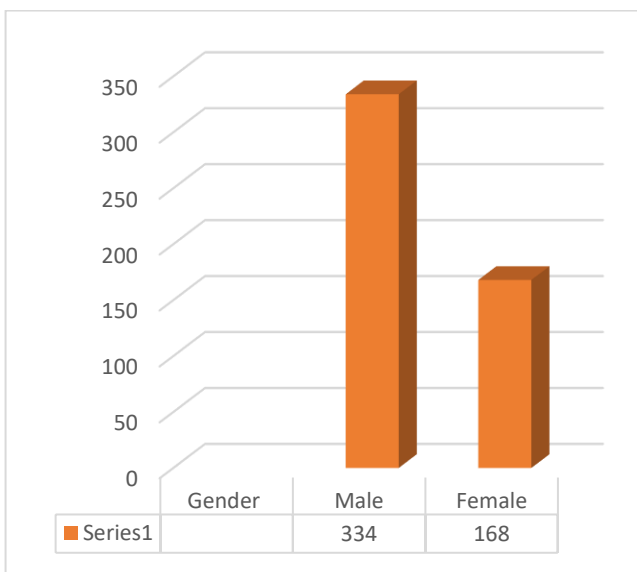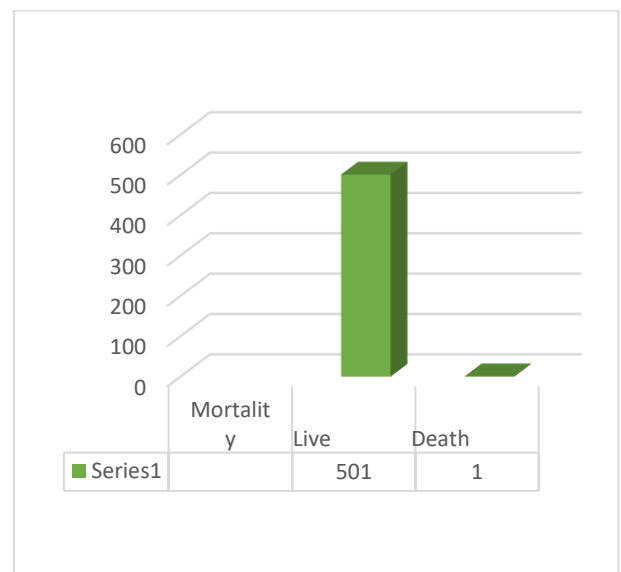|		
YES	176	35.1
NO	326	64.9
Tobacco use		
YES	43	8.6
NO	459	91.4
Mortality		
Live	501	99.8
Death	1	0.2
Education		
YES	502	100.0
Compliance		
YES	502	100.0

Fig 1: Bar graph showing gender distribution.

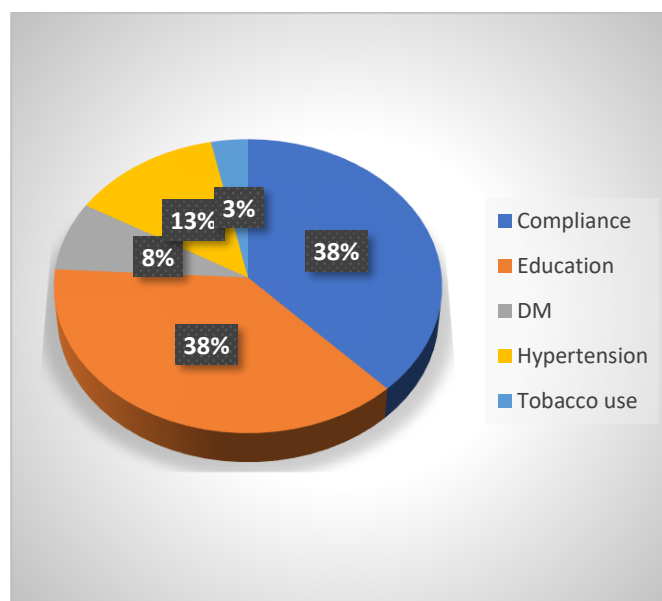Fig 2: Frequency of mortality

Fig 3: Patients distribution on the basis of DM, HTN and Tobacco use, compliance and Education.

DISCUSSION

Adherence to dual antiplatelet therapy (DAPT) is critical for patients who have undergone percutaneous coronary intervention (PCI) or experienced acute coronary syndrome. DAPT typically involves the combination of aspirin and a P2Y12 receptor inhibitor, such as clopidogrel, prasugrel, or ticagrelor. The aim of the present study was to investigate patient outcomes related to adherence to DAPT following PCI.

Discontinuation of antiplatelet therapy is a significant predictor of unfavorable outcomes after coronary stenting. In this study, all patients from our hospital demonstrated complete compliance with antiplatelet therapy, achieving a remarkable 100.0% adherence rate in the previous month. Comparatively, a study in Vietnam reported a compliance rate of 70.86% (8). Research indicates a general trend of decreasing adherence to antiplatelet treatment over time, particularly with longer therapy durations (9-11), with some studies showing a slight decrease in compliance (12-14). Full adherence to prescribed medications is crucial for optimal therapeutic outcomes, particularly in conditions requiring long-term management. Adherence to DAPT reduces the risk of thrombotic events such as heart attacks and strokes, which in turn minimizes mortality rates. In our study, we observed a mortality rate of only 1 (0.2%) patient, with the remaining patients surviving.

One key factor contributing to adherence in our study was patient education. All enrolled patients were educated, which facilitated better follow-up after surgery and a deeper understanding of the disease compared to uneducated individuals. However, factors that can reduce compliance rates include low income, lack of awareness about the importance of medication, and insufficient doctor-patient communication. Health education and effective communication are essential for supporting compliance. Blinch et al. noted that noncompliance was higher when patients were not adequately informed by health workers about the benefits of medication upon discharge (15).

Our study also assessed the prevalence of diabetes mellitus (DM), hypertension, and tobacco use. We found a lower incidence of these conditions among our patients. DM is strongly linked to coronary artery disease, particularly in older patients (16), and individuals with diabetes often exhibit a more unfavorable cardiovascular risk profile compared to non-diabetics (17).

The strength of this study lies in its high compliance rate and comprehensive follow-up, offering valuable insights into the effectiveness of health education in medication adherence. However, the study's limitations include its single-center design and the lack of a control group, which may affect the generalizability of the findings. Future studies should consider multicenter designs and include diverse patient populations to validate these results further.

CONCLUSION

The study concluded that the rate of adherence to dual antiplatelet therapy among patients undergoing percutaneous coronary intervention did not show a significant decline over the treatment period. This finding provides valuable evidence to inform improved clinical practices and healthcare delivery in our hospital. Furthermore, the study underscores a significant association between dual antiplatelet adherence and enhanced patient health, as well as a lower mortality rate.

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