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Case Report

Balancing Risk and Benefit of Antiplatelet Therapy in the Acute Coronary Syndrome Patient with Thrombocytopenia: A Case Report

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ABSTRACT

Background: Antiplatelets are one of the cornerstones of treatment for Acute coronary syndrome (ACS), although it is risky in patients with thrombocytopenia. In choosing antiplatelets, physicians must carefully weigh the risks of ischemia and bleeding. **Case Summary**: A 68-year-old male came to ED with a 2-day history of left-sided chest pain, exacerbated 1 hour before admission. The preliminary ECG revealed ST elevation in lead V2-V5 and laboratory examination showed low platelets in four days ($32x10^3$/uL; $29x10^3$/uL; $47x10^3$/uL; $87x10^3$/uL). The patient received a loading dose of Aspirin 160 mg. However, Clopidogrel 1x75mg was administered on the second day of treatment. After 5 days of treatment, the patient's condition improved, and his platelet count increased steadily. **Conclusion:** Antiplatelet therapy is required to avoid ischemic complications, but it enhances the risk of bleeding in individuals with thrombocytopenia. There have been few studies on the use of antiplatelets in thrombocytopenia. Monotherapy is preferred over dual therapy, however the risk/benefit ratio, clinical response, and monitoring for bleeding issues in the patient must all be considered.

Highlights:

1. This case illustrates that cautious antiplatelet monotherapy may be a viable strategy in ACS patients with thrombocytopenia. In this 68-year-old with ST-elevation MI and platelets <50×10³/μL, delayed Clopidogrel monotherapy—guided by clinical stability and rising platelet counts—led to improvement without bleeding complications.

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Introduction

Acute coronary syndromes (ACS) require immediate and adequate treatment. Dual antiplatelet therapy (DAPT) is necessary in ACS but carries risks in patients with thrombocytopenia. Clinicians face a unique challenge in managing this condition because of the increased risk of bleeding and, paradoxically, ischemic events[1]. Medications to prevent coronary occlusion pose the danger of uncontrolled bleeding, necessitating clinicians to balance the risk of ischemia and hemorrhage carefully. Many considerations are needed when using antiplatelets in thrombocytopenia patients because there are still no definite guidelines[2]. Although there are no specific guidelines, it is generally believed that no limitations to the general ACS treatment protocol should be applied if the platelet count is greater than 30-50 × 10^9/L (defined as mild to moderate thrombocytopenia), except when using (still based on minimal evidence) clopidogrel as the preferred P2Y12 inhibitor over more potent agents, i.e. prasugrel or ticagrelor. According to various studies, the management of ACS patients with thrombocytopenia, particularly severe thrombocytopenia, is challenging especially when percutaneous coronary intervention (PCI) is required[1,3]. As a result, we tried to determine how to balance the benefits and risks of antiplatelet therapy in patients with ACS and thrombocytopenia. What should be emphasized is the need to weigh therapeutic effectiveness and safety in this crucial clinical challenge.

Case Presentation

A 68-year-old man complained of left-sided chest pain for 2 days, which worsened 1 hour before admission. His chest pain radiated to the epigastrium accompanied by cold sweat, nausea, dizziness, and fever. He had a history of hypertension, diabetes, and CKD since 2008. He routinely received Insulin Aspart 3x10 IU, Amlodipine, and Candesartan. Physical examination revealed normal vital signs: BP 110/60 mmHg, HR: 68 x/min, RR: 20 x/min, T: 36°C, SpO2: 98%. There is no chest wall retraction. Normal vesicular breath sounds without rales or wheezing. Single S1 and S2 sounds were normal without any murmurs. But, the patient complained of epigastric tenderness. There was no limb edema.

A preliminary 12 lead electrocardiogram (ECG) examination revealed sinus rhythm, 68 BPM with ST elevation in lead V2-V5 (Figure 1). Then the laboratory examination revealed thrombocytopenia (32 x 10^3/uL), increasing ureum (43.3 mg/dL), and creatinine (1.99 mg/dL). The patient was treated with loading doses of Aspirin 160 mg, ISDN 3x5 mg (if needed), Bisoprolol 1x2.5 mg, Atorvastatin 1x40 mg, Insulin Aspart 3x10 IU, Pantoprazole 2x40 mg, Ondancentron 3x4 mg, Antacide 3xCI. Then, the patient was admitted to the ward for further care.

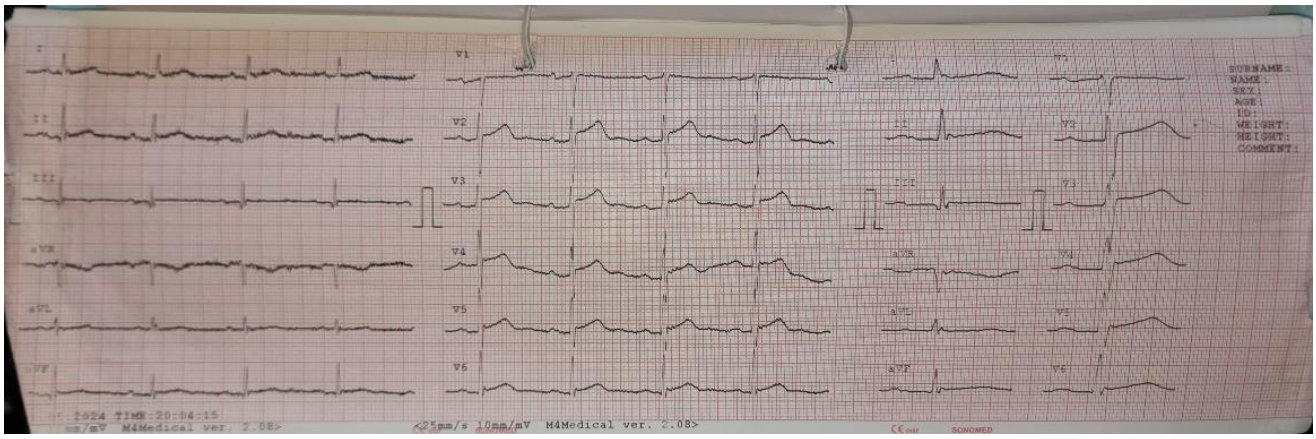

Figure 1. ECG at first admission

On the next day, his chest pain had reduced, but he still felt nauseous. Complete blood work was performed from the first admission day till the fourth day of care. Blood work on the second day revealed a platelet reduction (29 x 10^3/uL). The patient was started on DAPT (aspirin 1x80 mg and clopidogrel 1x75mg) with ISDN 3x5 mg ~ if needed, Atorvastatin 1x20 mg, Carvedilol 2x3.125 mg, Pantoprazole 2x40 mg, Insulin Aspart 3x10 IU, Ondancentron 3x4 mg, and Antacids 3C1. Subsequently, the same medication was administrated until the fourth day of care.

Table 2. Blood Work on the second – fourth day in the ward.

Parameters	Results			Unit	Reference Range
	Second day	Third day	Fourth day		
WBC	9.02	8.08	6.12	10^3/ uL	13.0 – 18.0
RBC	4.70	4.60	4.35	10^6/uL	4.5 – 6.5
HGB	13.6	13.3	12.6	g/dL	3.8 – 10.6
HCT	**39.0**	**39.1**	**37.1**	%	40 – 52
PLT	**29**	**47**	**87**	10^3/uL	150 – 440
RBG	151	**285**	**214**	mg/dL	≤ 200
FBG	138	**162**	**141**	mg/dL	70 – 110

On the third day, the patient no longer complained of chest pain or nausea, although her blood work still indicated a modest increase in platelets (47 x 10^3/uL). Then the doctor diagnosed the patient with dengue hemorrhagic fever. On the next day, his blood work revealed an increase in platelets over the previous day (87 x 10^3/uL). Then, on the fifth day, the patient's condition improved and he was discharged.

Discussion

The patient's condition, which included STEMI and thrombocytopenia, prohibited him from receiving antiplatelet and anticoagulant medications as he would in a normal population. Based on The Academic Research Consortium for High Bleeding Risk (ARC-HBR), the patient had a risk of high bleeding risk (HBR). Chronic kidney disease (CKD) and thrombocytopenia ($32x10^3$/uL) were the two main criteria identified in this patient. As a result, this patient qualifies as an HBR patient.[4]

On the other hand, the use of antiplatelet medication in ACS patients with thrombocytopenia is challenging for physicians, due to a higher risk of bleeding. There are currently few recommendations for treating this condition. Approximately 5% of patients with ACS have thrombocytopenia (PLT <$150x10^9$/L), which is often associated with diabetes, kidney failure, heart failure, or other cardiovascular disorders.[1]

Patients with severe thrombocytopenia (<50x109/L), such as this patient, have a higher risk of mortality. According to reports, one in every four patients with severe thrombocytopenia does not survive hospitalization. Some individuals may not obtain appropriate medications, such as β-blockers and statins[5]. However, some evidence suggests that beneficial effects of drugs such as Aspirine, β-blockers, statins, angiotensin-converting enzyme inhibitors (ACEIs) or angiotensin II receptor blockers (ARBs), spironolactone and coronary revascularization have also been found in the population of patients with cancer, who commonly present with thrombocytopenia.[6]

Despite the higher risk of bleeding in these patients, Aspirin is still given. Aspirin is relatively safe and is a frequently used combination with DAPT[6]. In an opinion published by the ESC in 2017, the use of any antiplatelet is not recommended in the presence of platelets <$50x10^9$/uL or active bleeding[1]. Recommendations from Juri et al. suggest that antithrombotic can be given to oncology patients with ACS. Because this patient's platelet count was $32x10^3$/uL, numerous therapy options are available, including anticoagulation with unfractionated heparin (UFH) (dosage of 30 to 50 U/kg) and antiplatelet with DAPT after a risk/benefit analysis [Aspirin dose (300/75 mg) and Clopidogrel (300-600/75 mg)][7]. Alaa et al. recommended the use of antiplatelets in thrombocytopenia (range 30-$50x10^9$/L) with a single antiplatelet medication, including aspirin or clopidogrel, and postponing anticoagulation. However, the study only looked at thrombocytopenia caused by Immune Thrombocytopenia. If the platelet count exceeds $50x10^9$/L after 48 hours of first therapy, DAPT and parenteral anticoagulants can be administered[8]. Several studies have compared aspirin and clopidogrel for gastrointestinal bleeding, with aspirin being preferred over clopidogrel.[9]

In this case, the patient was given Aspirin 160/80 mg since the first admission and Clopidogrel 1x75 mg on the second day. Several bleeding events must be assessed during antiplatelet administration to determine whether the drug can be continued, including epistaxis, hemoptysis, lower or upper gastrointestinal bleeding, bleeding from the urinary or genital tract, and a decrease in hemoglobin levels of more than 2 g/dL. As a result, it is vital to review the drugs administered, and whether they may be continued with dose modifications or discontinued[7]. During hospitalization, there were no bleeding events and this patient's hemoglobin level was within normal limits. Because this patient has CKD, the doses of Aspirin and Clopidogrel must be adjusted. According to ESC 2023, there were no dose modifications for aspirin, but there is not much information available for Clopidogrel regarding the recommended dose in patients with CKD stage V or end-stage renal disease.[10,11]

The use of statins in this patient is challenging, due to his CKD and thrombocytopenia conditions. There is limited data supporting the use of high-intensity statins in ACS with CKD. Several studies have indicated that statin treatment in CKD has a renoprotective effect on atorvastatin and simvastatin, resulting in a lower risk of hospitalization in patients who have undergone cardiac catheterization[12–15]. According to Shouqing et al., statins can alleviate thrombocytopenia in ITP patients but do not affect platelet count. However, the use of statins in cancer patients with thrombocytopenia resulted in the same favorable outcomes as in the general population.[6,16]

Conclusion

The mortality rate of ACS patients will rise as thrombocytopenia progresses. The use of antiplatelets in patients with HBR, such as thrombocytopenia, necessitates careful supervision and consideration of a variety of factors. The use and dose of antiplatelet medication should be changed based on the degree of thrombocytopenia. More randomized trials in this population are required to generate clinically meaningful recommendations and to assess the risks and benefits of taking antiplatelets in patients with thrombocytopenia.

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References

1. McCarthy CP, Steg GP, Bhatt DL. The management of antiplatelet therapy in acute coronary syndrome patients with thrombocytopenia: A clinical conundrum. Eur Heart J. 2017;38(47):3488–92.

2. Liga R, De Carlo M, De Caterina R. Antiplatelet therapy in patients with acute coronary syndromes and thrombocytopaenia: awaiting for evidence. Eur Hear J Case Reports [Internet]. 2021 Feb 1 [cited 2024 Dec 6];5(2):ytaa577. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC7859589/.
3. Iliescu CA, Grines CL, Herrmann J, Yang EH, Cilingiroglu M, Charitakis K, et al. SCAI Expert consensus statement: Evaluation, management, and special considerations of cardio-oncology patients in the cardiac catheterization laboratory (endorsed by the cardiological society of India, and sociedad Latino Americana de Cardiologbox drawings light down and lefta intervencionista). Catheter Cardiovasc Interv. 2016 Apr 1;87(5):E202–23.
4. Urban P, Mehran R, Colleran R, Angiolillo DJ, Byrne RA, Capodanno D, et al. Defining High Bleeding Risk in Patients Undergoing Percutaneous Coronary Intervention. Circulation. 2019;140(3):240–61.
5. Wang TY, Ou FS, Roe MT, Harrington RA, Ohman EM, Gibler WB, et al. Incidence and prognostic significance of thrombocytopenia developed during acute coronary syndrome in contemporary clinical practice. Circulation. 2009;119(18):2454–62.
6. Nates JL, Price KJ. Oncologic critical care. Oncol Crit Care. 2019;(October 2019):1–2099.
7. Radmilovic J, Di Vilio A, D'andrea A, Pastore F, Forni A, Desiderio A, et al. The Pharmacological Approach to Oncologic Patients with Acute Coronary Syndrome. J Clin Med [Internet]. 2020 Dec 1 [cited 2023 Jan 17];9(12):1–15. Available from: /pmc/articles/PMC7761724/.
8. Rahhal A, Provan D, Ghanima W, González-López TJ, Shunnar K, Najim M, et al. A practical guide to the management of immune thrombocytopenia co-existing with acute coronary syndrome. Front Med. 2024;11(April):1–11.
9. Graham C, Tan M, Chew D, Gale C, Fox K, Bagai A, et al. Use and Outcome of Dual Antiplatelet Therapy for Acute Coronary Syndrome in Patients with Chronic Kidney Disease: Insights From the Canadian Observational Antiplatelet Study (Coapt), a Multicentre Prospective Cohort Study. Can J Cardiol. 2021;37(10):S14–5.
10. Byrne RA, Rossello X, Coughlan JJ, Barbato E, Berry C, Chieffo A, et al. 2023 ESC Guidelines for the management of acute coronary syndromes. Eur Heart J. 2023;44(38):3720–826.

11. Roh JW, Lee SJ, Kim BK, Hong SJ, Kim HY, Ahn CM, et al. Ticagrelor vs. Clopidogrel in Acute Coronary Syndrome Patients with Chronic Kidney Disease After New-Generation Drug-Eluting Stent Implantation. Front Cardiovasc Med. 2021;8(January):1–11.
12. Yan YL, Qiu B, Wang J, Deng SB, Wu L, Jing XD, et al. High-intensity statin therapy in patients with chronic kidney disease: A systematic review and meta-analysis. BMJ Open. 2015;5(5):1–9.
13. Natanzon SS, Matetzky S, Beigel R, Iakobishvili Z, Goldenberg I, Shechter M. Statin therapy among chronic kidney disease patients presenting with acute coronary syndrome. Atherosclerosis. 2019;286:14–9.
14. Ma H, Liu Y, Xie H, Zhang G, Zhan H, Liu Z, et al. The renoprotective effects of simvastatin and atorvastatin in patients with acute coronary syndrome undergoing percutaneous coronary intervention. Med (United States). 2017;96(32).
15. Hou C, Zheng B, Wang X, Zhang B, Shi Q, Chen M. Renal impact of high-loading-dose statin pre-cardiac catheterization in patients with chronic kidney disease and long-term statin use. Exp Ther Med. 2019;1609–18.
16. Han S, Lu H, Yu Y, Liu X, Jing F, Wang L, et al. Hyperlipidemia in immune thrombocytopenia: a retrospective study. Thromb J. 2023;21(1):1–9.