Young Male Presenting with Acute Coronary Syndrome and Borderline Platelets Revealed Essential Thrombocythemia case report

Mohammad zyod[1], ahmad matarneh[2], and mohamed yassin[3]

[1]Hamad Medical Corporation Department of Medical Education
[2]Hamad medical corporation
[3]HMC NCCCR

June 27, 2022

Abstract

Essential thrombocythemia is a myeloproliferative neoplasm, with the risk of progression to other cancers, it is important to screen for ET in patients with acute coronary syndrome.

Young Male Presenting with Acute Coronary Syndrome and Borderline Platelets Revealed Essential Thrombocythemia case report

Mohammad K Alzyod1, Ahmad s. matarneh 1, Mohamed A. Yassin2

1 Department of Medicine, Hamad Medical corporation, Doha, Qatar

2 Department of Medical Oncology, Hematology section, National center for cancer and Research, Hamad Medical Corporation, Doha, Qatar

Corresponding Author

Ahmad matarneh

Department of Medicine, Hamad Medical corporation, Doha, Qatar

Rayan street

P.O box 3050

Ahmadmatarneh99@gmail.com

Tel: +97455957396

Short Title:

Acute Coronary Syndrome and Essential Thrombocythemia

Key words

Essential thrombocythemia, Acute coronary syndrome, Myeloproliferative neoplasms, Cardiovascular risks, Myocardial infarction, Case report

Abstract Background:

Essential thrombocythemia is myeloproliferative neoplasm, with the risk of progression to other cancers. Borderline platelet can be over seen and passed as normal or upper limit of normal. So complications can happen before diagnosis and treatment.

Case presentation:

This study reports a gentleman who is 32 years old; presented with typical chest pain, and diagnosed with acute coronary syndrome, coronary angiography showed 90% obstruction in the left anterior descending artery, percutaneous coronary intervention was done for him. Due to absence of risk factors, he was referred to hematology after 4 years of presentation and diagnosed with

Conclusion:

This study will highlight the importance of screening for myeloproliferative neoplasm in young with borderline platelet.

We also emphasize that early diagnosis and considering essential thrombocythemia and starting treatment as soon as possible can affect the outcome and prevent complications.

Introduction

Based on the British Journal of Haematology, Myeloproliferative neoplasms are a group of hematopoietic myeloid neoplasms, classically described as Philadelphia positive myeloproliferative neoplasm; chronic Myeloid Leukemia(1), and Philadelphia negative myeloproliferative neoplasm ;polycythemia vera, Essential thrombocythemia, myelofibrosis, profibrotic myelofibrosis (2,3).

Essential thrombocythemia is the most common type of myeloproliferative neoplasms. The cause of ET is the overproduction of hematopoietic cells due to mutation of JAK2, CALR or MPL genes. 55% of essential thrombocythemia have JAK2 mutation (2), essential thrombocythemia is usually scattered but it was found to be familial in rare cases in different parts of the world (4).

Coronary artery disease including acute coronary syndrome; it refers to a variety of clinical presentations ranging from those for ST-segment elevation myocardial infarction to presentation found in non-ST-segment elevation myocardial infarction or in unstable angina (5).

Case presentation

A 30-year-old Egyptian male; nonsmoker, with no previous medical illnesses, presented to the Emergency Room complaining of chest pain. This pain had been stabbing in nature involving the central area of the chest, aggravated by exertion and relieved by rest, with no radiation elsewhere.

After examination, he was not in distress, he was vitally stable, chest was clear, normal heart sounds. Laboratory findings state that Hemoglobin levels are within normal limits along with is White cell counts while his platelets are slightly above the upper limit (table1).

Cardiac enzymes were elevated, electrocardiography showed significant ST segment changes, echocardiography showed normal ejection fraction with no valve lesions and no wall motion abnormality.

Patient was diagnosed with Non ST-segment elevation myocardial infarction and sent to

Cath lab where he was found to have 90% stenosis in the proximal part of left anterior descending artery, Stent was placed and patient was discharged on anti-ischemic medications

Four years after cardiac event, patient referred to hematology clinic because of persistent thrombocytosis. He was seen in hematology clinic; work up for essential thrombocytosis was done. JAK2 mutation was positive and consistent with myeloproliferative neoplasms

Moreover, bone marrow biopsy was done and was consistent with essential thrombocytosis. He received aspirin which made his platelet counts improve.

(Figure 1) platelets before initiation of treatment

(Figure 2) platelets after initiation of treatment

Discussion

According to the world health organization diagnosis of essential thrombocythemia requires 4 major criteria (a-Platelet count [?] 450 × 109/L, B- Bone marrow picture consistent with essential thrombocythemia, C- Not meeting world health organization criteria for BCR- ABL1 + chronic myeloid leukemia, Polycythemia vera, primary myelofibrosis, myelodysplastic syndrome or other myeloid neoplasm, D- Presence of JAK2, CALR or MPL mutation, or presence of 3 major criteria and 1 minor criteria (absence of evidence for reactive thrombocytosis)" (6).

We consider four risk categories in essential thrombocythemmia; very low (age [?] 60 years, no thrombosis history, JAK2 wild-type), low (same as very low but JAK2 mutation present), intermediate (age $>$ 60 years, no thrombosis history, JAK2 wild-type) and high (thrombosis history present or age $>$ 60 years with JAK2 mutation) (6).

The patient with absent risk factors of thrombosis, and borderline platelet count, push us to think of essential thrombocythemia as the cause of thrombotic events when there is absence of other risk factors regardless of how much platelet count is elevated.

Commonly speaking, coronary syndrome is one of the thrombotic diseases, and it is crucial to identify the risk factors for it. Essential thrombocythemia is one of the risk factors for developing ACS, which should not be missed in patients presenting with acute coronary syndrome especially those with absent other risk factors.

Most of the patients who present with acute coronary syndrome with background of essential thrombocythemia have few or no other risk factors for acute coronary syndrome, in comparison to other acute coronary syndrome causes, and this is because the events are mainly due to thrombosis.

The risk of developing acute coronary syndrome in patient with essential thrombocythemia is not uncommon (7). As most of cardiologist with focus on treating of the cardiac even and with not give attention to the risk factors which resulting in missed diagnosis of essential thrombocythemia especially in patient with borderline platelet count.

Many patients with borderline platelets count pass unnoticed, they would come for many other reasons to the health care facility and leave without further work up. The patient we include in this study came in many occasions with borderline platelets count and one of these was with major complication of the disease, however he was missed by the physicians. The reason for that could be the shortage of awareness about the new criteria for diagnosis, which leads to under estimation, as many physicians will not put essential thrombocythemia in their mind until they see a big rise in platelet count.

Conclusion

Taking everything into consideration, Thrombosis is one of the major complications of essential thrombocythemia, it occurs around 50% of patient with essential thrombocythemia at the time of diagnosis. Initiating Treatment early will decrease the number of essential thrombocythemia induced thrombosis. Therefore, it is important to increase the awareness among physicians about the new world health organization criteria for the diagnosis and

emphasizing on putting essential thrombocythemia on the top of differential diagnosis especially in patients with no other risk factors of thrombosis, to help catch the disease early and reduce the risk of thrombosis.

Acknowledgement

The author would like to thank Qatar National Library for funding this publication. We would also like to thank Internal Medicine Residency Program at Hamad Medical Corporation for supporting research.

Ethics approval and consent to participate

Case approved by HMC Medical Research center. the patient gave his written informed consent for his case to be Published.

Consent for publication

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in- chief of this journal

Availability of supporting data

Not applicable

Competing of interest

The authors declare that they have no competing interests

Funding Sources

Qatar National Library: Phone number: +97444540100; Fax number: +974445440401; Email address: qnl@qnl.qa

Authors' Contribution

Mohammad K Alzyod: writing and editing

Ahmad matarneh: Review and corresponding author

Mohamed A. Yassin: writing and editing

References

1. Turkina A;Wang J;Mathews V;Saydam G;Jung CW;Al Hashmi HH;Yassin M;Le Clanche S;Miljkovic D;Slader C;Hughes TP; TARGET: a survey of real-world management of chronic myeloid leukaemia across 33 countries [Internet]. British journal of haematology. U.S. National Library of Medicine; [cited 2021Feb25]. Available from: https://pubmed.ncbi.nlm.nih.gov/32227648/

2. Yassin MA;Taher A;Mathews V;Hou HA;Shamsi T;Tuğlular TF;Xiao Z;Kim SJ;Depei W;Li J;Rippin G;Sadek I;Siddiqui A;Wong RS; MERGE: A Multinational, Multicenter Observational Registry for Myeloproliferative Neoplasms in Asia, including Middle East, Turkey, and Algeria [Internet]. Cancer medicine. U.S. National Library of Medicine; [cited 2021Feb25]. Available from: https://pubmed.ncbi.nlm.nih.gov/32351024/

3. Yassin MA, Nehmeh SA, Nashwan AJ, Kohla SA, Mohamed SF, Ismail OM, et al. A study of 18F-FLT positron emission tomography/computed tomography imaging in cases of prefibrotic/early primary myelofibrosis and essential thrombocythemia [Internet]. Medicine. Lippincott Williams & Wilkins; 2020 [cited 2021Feb25]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7647608/

4. Al-Dewik N;Ben-Omran T;Zayed H;Trujillano D;Kishore S;Rolfs A;Yassin MA; Clinical Exome Sequencing unravels new disease-causing mutations in the myeloproliferative neoplasms: A pilot study in patients from the state of Qatar [Internet]. Gene. U.S. National Library of Medicine; [cited 2021Feb25]. Available from: https://pubmed.ncbi.nlm.nih.gov/30553997/

5. Tefferi A, Vannucchi AM, Barbui T. Essential thrombocythemia treatment algorithm 2018 [Internet]. Blood cancer journal. Nature Publishing Group UK; 2018 [cited 2021Feb25]. Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5802626/

6. Barbui T, Tefferi A. Polycythemia vera and essential thrombocythemia [Internet]. American journal of hematology. 2017. Available from: https://onlinelibrary.wiley.com/doi/abs/10.1002/ajh.26008

7. Posfai D. Outcomes after Acute Ischemic Stroke in Patients with Thrombocytopenia or Thrombocytosis [Internet]. 2006. Available from: Https://Www.researchgate.net/Journal/ 18785883_Journal_of_the_-Neurological_Sciences

8. [9]

9. [10]