

Ischemic Stroke in a patient with Essential Thrombocythemia: Case Report

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Abstract

Essential thrombocythemia represents a rare risk factor for ischemic stroke. Uncontrolled proliferation of megakaryocytes sustained increases circulating platelet count and thrombotic risk. Many patients suffering from the disease may have no symptoms for a long time. We present a case of 60 year old lady with ischemic stroke who was a known case of essential thrombocythemia. And the cerebrovascular event was the complication of essential thrombocythemia as she quit treatment.



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Introduction

Essential Thrombocythemia (ET) is a rare myeloproliferative disorder characterized by persistent raised peripheral platelet count usually being in excess of $1 \times 10^9/L^1$. It has female preponderance and usually occurs in the fifth or sixth decade of life². The JAK2V617F mutation positivity is found in 50–60% of cases³. The incidence varies from 0.2 to 2.5 per 100000 people per year, with a prevalence of 38 to 57 cases per 100000 people⁴. The Polycythemia Vera Study Group has defined essential thrombocythemia as a subgroup of patients having persistent thrombocytosis (platelet count greater than or equal to $1 \times 10^9/L$), megakaryocyte hyperplasia in the bone marrow, absence of other identifiable cause, absence of Philadelphia chromosome, absence of prominent marrow fibrosis or myeloid metaplasia or both, and absence of increased erythrocyte mass in the setting of normal iron stores⁵. Recently, in 2016 WHO revised criteria for diagnosing ET includes 4 major criteria and 1 minor criterion where diagnosis of ET requires meeting all major criteria or the first 3 major criteria and the minor criterion⁶. Essential

thrombocythemia is associated with spontaneous hemorrhages due to platelet dysfunction as well as thrombosis involving the arterial and venous systems along with pulmonary vasculatures. Thrombotic disorders like stroke, myocardial infarction, venous thrombosis, and particularly digital ischemia are reported earlier in our country⁷. Venous thrombosis in atypical sites especially involving splanchnic or cerebral veins is more frequent in ET than in general people⁸. Neurologic features of ET include amaurosis fugax, transient ischemic attacks, stroke and other syndromes published in literatures as case reports⁹. Here we report a case of essential thrombocythemia who presented with acute ischemic stroke.

Case report

A 60 year old lady admitted on 28th march, 2022 in the stroke unit of a tertiary care hospital with the complaints of left sided weakness of body and altered level of consciousness for 8 hours. She was hypertensive, non-diabetic and currently taking amlodipine 5mg once daily. Past medical history significant for fracture neck of left femur in 2019 which was treated conservatively and from that time she was almost bedridden. In that time she also received a diagnosis of essential thrombocythemia by a hematologist based on complete blood count and bone marrow examination findings and treated by hydroxyurea and aspirin. But due to the covid-19 pandemic situation she did not maintain regular follow up with her physician and quit medication for last 14 months. Examination revealed GCS- 9/15, gaze deviated to right side, and pupils

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Table 1. Recent CBC and routine investigations, follow up CBC and CBC, PBF and Bone marrow study report at the time of diagnosis of essential thrombocythemia

28 th march, 2022	Follow up CBC (6 th april, 2022)	July, 2019
Hb-11.2 gm/dl	Hb- 11.4 gm/dl	Hb-11.6 gm/dl
ESR-32 mm in 1 st hr	ESR- 29 mm in 1 st hr	ESR-38 mm in 1 st hr
WBC- 16×10 ⁹ /L	WBC- 11×10 ⁹ /L	WBC- 14×10 ⁹ /L
Neutrophil- 91%	Neutrophil- 71%	Neutrophil-67%
Lymphocyte- 04%	Lymphocyte- 22%	Lymphocyte- 26%
Monocyte- 03%	Monocyte- 4%	Monocyte- 03%
Eosinophil- 02%	Eosinophil-3%	Eosinophil- 04%
TC ofRBC- 5×10 ¹² /L	TC ofRBC- 5.1×10 ¹² /L	TC ofRBC- 4.37×10 ¹² /L
PCV- 35%	PCV-37%MCV-78 fl	PCV-37.8%MCV-86.5 fl
MCV-77 fl	MCH-27 pg	MCH-26.5 pg
MCH-25 pg	MCHC-31 g/dl	MCHC-30.7 g/dl
MCHC-32 g/dl	TC ofPlatelet- 636×10 ⁹ /L	TC ofPlatelet- 1255×10 ⁹ /L
TC ofPlatelet- 880×10 ⁹ /L		
S. Na- 127 mmol/l	-	PBF
S. K- 5.1 mmol/l		RBC shows anisocytosis with anisochromia
S. Cl- 89 mmol/l		WBC mature with above count and distribution
		Platelet increased in number with normal morphology
		Comment: Thrombocytosis
SGPT-07 U/L	-	-
S. Creatinine- 0.83 mg/dl		
Trop-I- 0.008 ng/ml		
HbA1c- 5.6%		
Urine RME-		
Protein (+)		
Sugar (nil)		
Pus cell- 8-10/HPF		
RBC- nil		

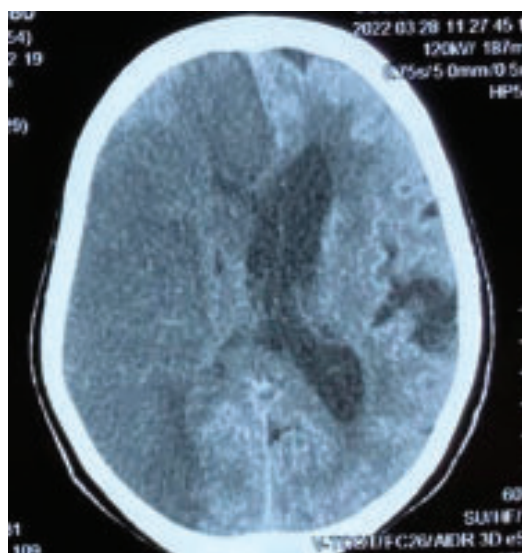


Figure 1: Non-contrast CT of head showing hypodensity involving right fronto-parietal lobe sparing the occipital pole along with ventricular effacement and mid line shifting indicating mass effect.

were reacting to light, pulse- 86 beats/min (regular), BP- 100/60 mm of Hg, and extensor planter response in left side. Chest was clear on auscultation and no organomegaly detected on abdominal examination. Random blood sugar was 7.6 mmol/l. Non contrast CT head showed large acute infarct involving right fronto-parietal region with significant mass effect (figure). Routine investigations revealed high platelet count, abnormal lipid profile, low serum sodium and normal renal and liver function (table). ECG was in sinus rhythm.

She received standard care of stroke. We also consulted with hematologist in our institute and hydroxyurea restarted under supervision of hematologist along with aspirin and allopurinol. Subsequent follow up CBC showed improvement of platelet counts. Patient’s attendants were counseled properly regarding the sequel of the disease and benefit of treatment and she was discharged from hospital after 10 days and kept under regular follow up.

Discussion

Essential thrombocythemia is recognized as a risk factor for cerebral ischemic events, but is encountered very rarely. Analysis of pathogenic mechanism behind vascular occlusion has demonstrated a causal relationship between elevated platelet count and marked abnormalities of platelet function¹⁰. A small number of diagnosed cases with essential thrombocythemia can develop acute leukemia or myelofibrosis later. But most of the cases, they may have a normal lifespan if they are closely monitored and treated appropriately, in particular to avoid its complications¹¹. Ischemic stroke is a recognizable complication of essential thrombocythemia but the most frequent risk factors of the ischemic stroke are atherosclerosis and cardiac arrhythmias. In the present case, we considered that cerebral infarction was secondary to platelet aggregation. Our patient had no cardiac arrhythmia but older age and HTN may be the contributing factor behind the ischemic even though HTN was well controlled. Pavaloiu RM and Mogoanta L¹¹ reported an elderly hypertensive patients presented with recurrent ischemic stroke due to essential thrombocythemia. In a case series of ischemic stroke Richard S^{et al}¹² also found that essential thrombocythemia is the risk factor behind the ischemic events, although other vascular risk factors were also present. We report this case because to our knowledge, it is the first reported case of stroke due to essential thrombocythemia from our country. Ours is a previously diagnosed case who discontinues treatment that cost this sequel. So, proper counseling regarding the disease course, benefit of treatment and adherence to it is essential for eventful life.

The recommended therapeutic protocol of patients with ischemic vascular events due to essential thrombocythemia is combination of chemotherapeutic agents with antiplatelet drugs¹³. The ability of hydroxyurea to reduce platelet counts in patients with essential thrombocythemia is well known, but its effectiveness in reducing thrombotic complications is not fully understood therefore the combination with antiplatelet medication is indicated¹⁴. The non-alkylating agent hydroxyurea has been proposed as a treatment of choice in patients with essential thrombocythemia who has at least one previous thrombotic event and older than 60 years¹⁵. So, we restarted hydroxyurea in combination with aspirin in our patient. The effectiveness of hydroxyurea is documented in our case by reduction in platelet counts in subsequent follow up though it is still high.

Conclusion

Ischemic stroke is rare manifestation of the essential thrombocythemia. The importance of complete blood count should not be ignored in the setting of any ischemic event which can provide valuable information about the causal factor. Proper patient counseling and treatment adherence is essential to prevent complication of essential thrombocythemia.

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