Received: 2014.10.16
Accepted: 2015.03.05
Published: 2015.06.17

ISSN 1941-5923
© Am J Case Rep, 2015; 16: 374-376
DOI: 10.12659/AJCR.892787

Malignant Hypertension and Thrombotic Thrombocytopenic Purpura: False Friends

Authors' Contribution:
Study Design A
Data Collection B
Statistical Analysis C
Data Interpretation D
Manuscript Preparation E
Literature Search F
Funds Collection G

ABCDEF **Hossam Abdalla**
C **Mostafa Alfshawy**
B **Michael Babigumira**
A **Tayyaba Bashir**

Department of Internal Medicine, Icahn School of Medicine at Mount Sinai, Queens Hospital Center, Queens, NY, U.S.A.

Corresponding Author: Hossam Abdalla, e-mail: ABDALLH1@nychhc.org
Conflict of interest: None declared

Patient: Male, 63
Final Diagnosis: Thrombotic thrombocytopenic purpura
Symptoms: —
Medication: —
Clinical Procedure: Plasmapheresis
Specialty: Hematology

Objective: Challenging differential diagnosis

Background: Thrombotic thrombocytopenic purpura (TTP) is a rare hematologic disorder resulting in hemolysis of red blood cells, consumption of platelets, and occlusion of microvasculature. Malignant hypertension is the clinical syndrome of severe elevations in blood pressure and fundoscopic hypertensive retinopathy, including bilateral flame-shaped hemorrhage and papilledema.

Case Report: We describe the case of a 63-year-old man who presented with features of TTP and malignant hypertension treated with plasma exchange and developing end-stage renal disease.

Conclusions: Given the diagnostic uncertainty at presentation, clinicians should quickly intervene to control hypertension and institute plasma exchange as needed.

MeSH Keywords: Acute Kidney Injury • Hypertension, Malignant • Purpura, Thrombotic Thrombocytopenic

Full-text PDF: <http://www.amjcaserep.com/abstract/index/idArt/892787>

775 — 3 6

Background

Thrombotic thrombocytopenic purpura (TTP) is a rare hematologic disorder resulting in hemolysis of red blood cells, consumption of platelets, and occlusion of microvasculature. Malignant hypertension is the clinical syndrome of severe elevations in blood pressure and fundoscopic hypertensive retinopathy, including bilateral flame-shaped hemorrhage and papilledema. Here, we describe the case of a 63-year-old man who presented with features of TTP and malignant hypertension.

Case Report

A 63-year-old man with no significant medical history presented to the emergency department with generalized weakness for 3 weeks, shortness of breath for 2 weeks, mild hematemesis, epistaxis and blurry vision in the left eye, with worsening generalized weakness and dyspnea, especially after climbing stairs. Blood pressure on admission was 200/106 mmHg, non-dilated fundus exam was unremarkable. Laboratory tests showed WBC count of 11 000/cc, hemoglobin of 8.1 g/dl, hematocrit of 24.9%, and platelet count of 40 000/cc. Peripheral blood smear showed numerous schistocytes per HPF, polychromasia, anisocytosis, poikilocytosis, large platelets and WBC without any toxic granulations, and reticulocytes 4.97% with absolute count of 130 000. Results of lab tests showed BUN 140 mg/dl (10–25), creatinine 13.5 mg/dl (0.4–1.4), LDH 1328 (N<250), haptoglobin <30 (30–200) C3 72 (88–201), C4=15.7 (16–47), and 69% (68–163) ADAMTS13 activity after 1 week. Plasma exchange and hemodialysis were initiated immediately and the patient stopped bleeding. After a total of 6 sessions of plasma exchange, the platelet count gradually improved to normal and remained stable. However, peripheral blood smear findings were unchanged. Blood pressure was controlled with hydralazine, amlodipine, and metoprolol. Renal ultrasound suggested intrinsic renal parenchymal disease with hydronephrosis. Further lab work revealed an ANA titre of 1: 2560. Renal biopsy showed features of thrombotic microangiopathy (TMA) (Figures 1–3). The patient's symptoms resolved but renal impairment persisted and he was discharged on hemodialysis for end-stage renal disease.

Discussion

TMA is characterized by thrombocytopenia, microvascular thrombosis, hemolytic anemia, and schistocytes. TMA occurs not only in TTP and malignant hypertension alone but also in autoimmune diseases, vascular rejection, PNH, tumor cell embolism, eclampsia/preeclampsia disseminated intravascular coagulation, and drug toxicities [1]. A Japanese study tried to find the differences between patients with malignant hypertension

Figure 1. Cross-section of a large artery demonstrates intimal thickening and mucoid degeneration with significant narrowing of the lumen (H&E $\times 40$).

Figure 2. Portion of a segmentally sclerosed glomerulus shows marked wrinkling of the glomerular capillary loops. There is also an arteriole that shows obliteration of the lumen with prominent hyalinosis (PAS $\times 20$).

Figure 3. Cross-section of a large and small artery demonstrates obliteration of the lumen with "onion skin" lamination (Jones methylene blue silver stain $\times 10$).

leading to TMA and those without TMA, and found the former group to have higher mean systolic and diastolic blood pressure, aldosterone levels, and proteinuria but with lower creatinine clearance [2]. The differentiation between TTP and malignant hypertension can be challenging because elements of one can be found in the other, such as hemolysis and thrombocytopenia. In a case report with malignant hypertension and TTP and diagnosis of TTP, the patient refused plasma exchange and responded to blood pressure control alone [3].

Unfortunately, our patient's evaluation was limited because a thorough fundoscopic examination was not performed and the non-dilated exam did not show any abnormality, although in a case report TMA with hypertension did not show evidence of papilledema [4]. Malignant hypertension as the primary diagnosis was also found to cause microangiopathic hemolytic anemia with low ADAMTS 13 similar to TTP [5], which decreases diagnostic value of this test; this led other authors to recommend assessment of the degree of thrombocytopenia as a way to differentiate these [6] but no large study was done to confirm this finding.

The other problem that clinicians would face with such a problem is that the ADAMTS 13 test is not readily available in most hospitals and sending out labs can take up to 1 week to get a report back. Such patients admitted to the ICU cannot wait this long, so our approach was to tackle both pathologies by controlling blood pressure and starting plasma exchange, which greatly helped relieve the patient's symptoms, but unfortunately did not save his kidneys, likely because of the late presentation to our hospital.

References:

1. Benz K, Amann K: Thrombotic microangiopathy: new insights. *Curr Opin Nephrol Hypertens*, 2010; 19(3): 242–47
2. Akimoto T, Muto S, Ito C et al: Clinical features of malignant hypertension with thrombotic microangiopathy. *Clin Exp Hypertens*, 2011; 33(2): 77–83
3. Patel A, Patel H, Patel A: Thrombotic thrombocytopenic purpura: the masquerader. *South Med J*, 2009; 102(5): 504–9
4. Egan JA, Bandarenko N, Hay SN et al: Differentiating thrombotic microangiopathies induced by severe hypertension from anemia and thrombocytopenia seen in thrombotic thrombocytopenia purpura. *J Clin Apher*, 2004; 19(3): 125–29
5. van den Born BJ, van der Hoeven NV, Groot E et al: Association between thrombotic microangiopathy and reduced ADAMTS13 activity in malignant hypertension. *Hypertension*, 2008; 51(4): 862–66
6. Shibagaki Y, Fujita T: Thrombotic microangiopathy in malignant hypertension and hemolytic uremic syndrome (HUS)/ thrombotic thrombocytopenic purpura (TTP): can we differentiate one from the other? *Hypertens Res*, 2005; 28(1): 89–95

Last but certainly not least we need to emphasize that malignant hypertension and thrombotic thrombocytopenic purpura have similar presentation with minor differences, which prompts the search for better understanding of the difference in their pathophysiology to allow better management.

Conclusions

Given the diagnostic uncertainty at presentation, clinicians should quickly intervene to control hypertension and institute plasma exchange as needed. Further workup needs to be done to clearly distinguish these medical emergencies. Fundoscopic examination is an integral part of assessment of patients with hypertensive emergencies.

Acknowledgements

The following is a list of contributors we would like to acknowledge, who have provided general support. Stafford D. John, M.D., Chief of Nephrology at QHC; Fadi Salem, M.D., Chief of Renal Pathology Division at MSSM; Kawser U. Ahmed, M.D., Internist at QHC.

Statement

There are no financial grants or funding sources to declare. There is no conflict of interest for any authors of this manuscript.