

Thrombotic Microangiopathy (TMA)

TMA is a group of disorders characterized by thrombocytopenia, microangiopathic hemolytic anemia, and organ dysfunction, which can affect the brain, kidneys, heart, pancreas, liver, lungs, eyes, and skin



Patients may present with the following signs and symptoms

Thrombocytopenia¹⁻³

- Purpura
- Petechiae
- Prolonged bleeding
- Bleeding from gums or nose
- Blood in urine or stool, or bleeding from rectum
- Abnormal vaginal bleeding
- Headaches
- Easy bruising, retinal hemorrhage, and hemoptysis

Microangiopathic hemolytic anemia⁴

- Fatigue
- Dyspnea
- Dark urine
- Back pain
- Jaundice
- Paleness
- Resting tachycardia with flow murmur

Organ injury/AKI^{3,5}

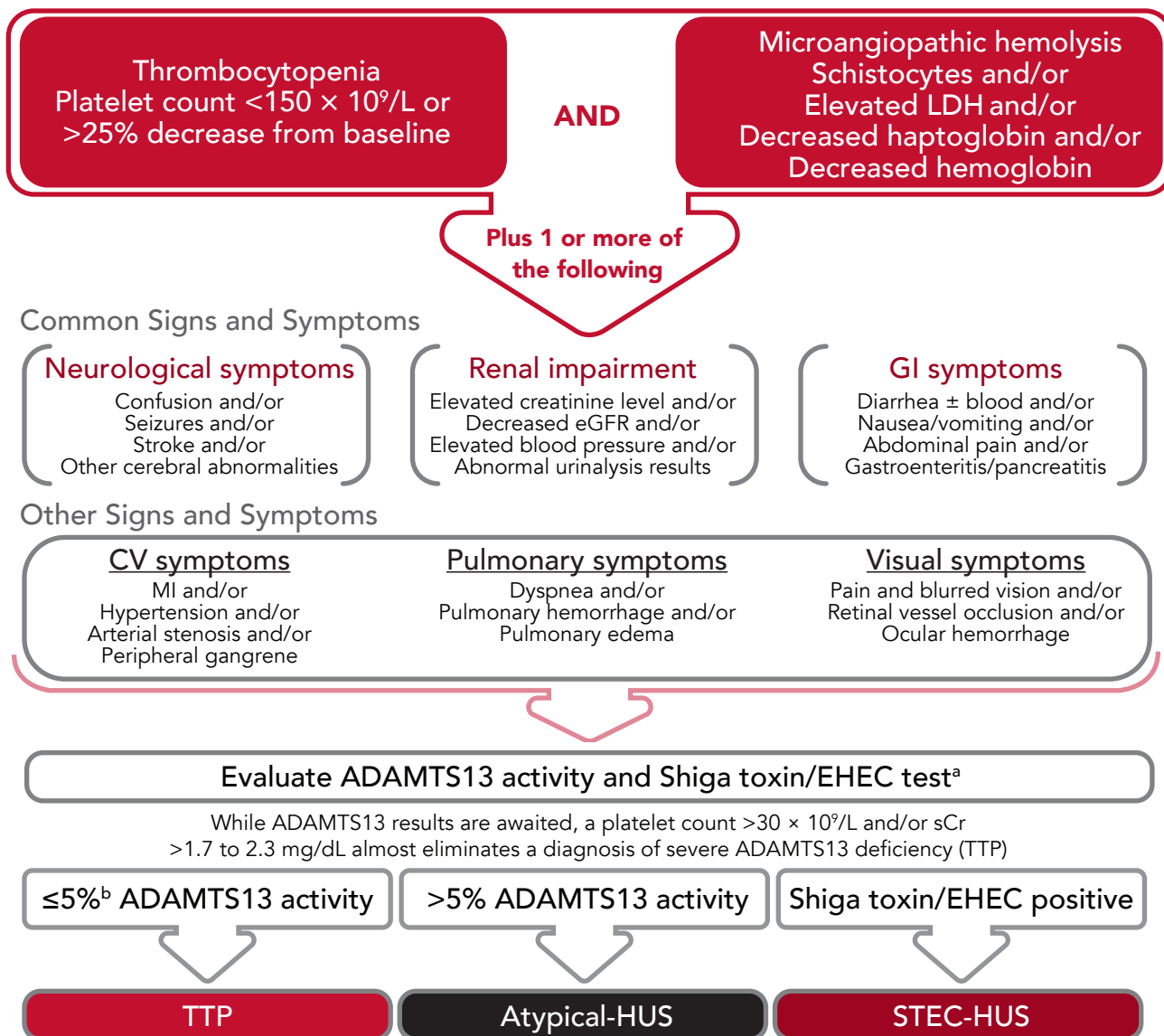
- Acute kidney injury
 - Listlessness
 - Confusion
 - Fatigue
 - Anorexia
 - Nausea
 - Vomiting
 - Proteinuria
 - Weight gain
- Edema
- Oliguria/Anuria
- Uremic encephalopathy
 - Decline in mental status, asterixis, neurologic symptoms
- Anemia
- Uremic platelet dysfunction
- Microhematuria

Patients may also present with other signs and symptoms^{3,4,6-8}

- CNS symptoms: Weakness, transient focal neurologic abnormalities, confusion, headache, paresis, aphasia, dysarthria, visual problems, encephalopathy, seizures, altered consciousness, coma
- Cardiac symptoms: Chest pain, heart failure, hypotension, hypertension, myocardial infarction
- GI symptoms: Severe abdominal pain, diarrhea, pancreatitis, vomiting
- Pulmonary symptoms: Dyspnea, pulmonary hemorrhage, pulmonary edema

OVER →

TMAs require rapid differential diagnosis⁹⁻¹²



TMA can also manifest in the presence of clinical conditions such as the following

- Pregnancy-postpartum
- Malignant/severe hypertension
- Solid organ transplantation
- Autoimmune disease (eg, SLE, scleroderma)
- Hematopoietic stem cell transplantation

^aShiga toxin/EHEC test is warranted with history/presence of GI symptoms. ^bRange found in published literature is $<5\%$ - 10% .

ABBREVIATIONS

ADAMTS13, a disintegrin and metalloproteinase with a thrombospondin type 1 motif member 13; AKI, acute kidney injury; CNS, central nervous system; CV, cardiovascular; EHEC, enterohemorrhagic Escherichia coli; eGFR, estimated glomerular filtration rate; GI, gastrointestinal; HUS, hemolytic uremic syndrome; LDH, lactate dehydrogenase; MI, myocardial infarction; sCr, serum creatinine; STEC, Shiga toxin-producing Escherichia coli; TMA, thrombotic microangiopathy; TTP, thrombotic thrombocytopenic purpura.

REFERENCES

1. National Heart Lung and Blood Institute. Thrombocytopenia. <https://www.nhlbi.nih.gov/health-topics/thrombocytopenia>. Accessed May 20, 2019. 2. Gauer RL, Braun MM. *Am Fam Phys*. 2012;85:612-622. 3. Scully M, et al. *Br J Haematol*. 2012;158:323-335. 4. Dhaliwal G, et al. *Am Fam Phys*. 2004;69:2599-2606. 5. Rahman M, et al. *Am Fam Phys*. 2012;86:631-639. 6. Sakari Jokiranta T, et al. *BMC Nephrol*. 2017;18:324. 7. George JN, Nester CM. *New Engl J Med*. 2014;371:654-666. 8. Brocklebank V, et al. *Clin J Am Soc Nephrol*. 2018;13:300-317. 9. Goodship THJ, et al. *Kidney Int*. 2017;91:539-551. 10. Azoulay E, et al. *Chest*. 2017;152:424-434. 11. Laurence J, et al. *Clin Adv Hematol Oncol*. 2016;14:2-15. 12. Asif A, et al. *J Nephrol*. 2017;30:347-362.