



Case courtesy of Dr. Tim Gallagher (Pensacola, FL) and Dr. Jason Byrd (Maples Center for Forensic Medicine, U. of Florida)

1. A 65-year-old woman is found deceased on the couch of her living room after returning from a mall shopping trip. There was no sign of trauma and the residence was secured. Her last visit for a routine health examination showed her temperature was 36.7°C, pulse was 72/min, respirations were 15/min, and blood pressure was 160/105 mm Hg. She had no acute or chronic health complaints, major medical illnesses or surgical procedures during her lifetime. An ultrasound of her abdomen showed that the left kidney was significantly smaller than the right kidney (see autopsy photo above).

Which of the following laboratory findings is most likely associated with her cause of death?

- Anti-double-stranded DNA titer 1 : 512
- C-ANCA titer 1 : 256
- Plasma glucose level 200 mg/dL
- HIV test positive
- Plasma renin 15 mg/mL/hr

Responses:

A. Anti-Double-Stranded DNA titer 1:512 (3.55% responses)

The anti-double stranded DNA antibody test is a blood test that looks for antibodies to double stranded DNA. The anti-dsDNA antibody test is a very specific test for Systemic Lupus Erythematosus (SLE), and anti-dsDNA antibodies are not found in other autoimmune disorders. Systemic lupus erythematosus (SLE) is a chronic autoimmune disease that can affect almost any organ system. Its presentation and course are highly variable, ranging from indolent to fulminant. It often presents in childhood and may include a malar rash (butterfly pattern rash over the cheeks and bridge of the nose), mucocutaneous ulcers, proteinuria, seizures, fever, lymphadenopathy and hemolytic anemia. The classic presentation of a triad of fever, joint pain, and rash in a woman of childbearing age should prompt investigation into the diagnosis of SLE.

B. C-ANCA titer 1:256 (4.61% responses)

Antineutrophil cytoplasmic autoantibodies (ANCA) are specifically associated with small-vessel systemic vasculitis and are excellent diagnostic markers for these diseases. C-ANCA targets the PR3 (proteinase 3) protein which can lead to vascular inflammation. There are four common types of this disorder. Granulomatosis with polyangiitis (GPA, previously called Wegener's disease) most often affects the lungs, kidneys, and sinuses. Microscopic polyangiitis (MPA) can affect the lungs, kidneys, nervous system, and skin. Eosinophilic granulomatosis with polyangiitis (EGPA, previously called Churg-Strauss syndrome) usually affects the skin and lungs, and often causes asthma. Polyarteritis nodosa (PAN) most often affects the vessels of the heart, kidneys, skin, and central nervous system.

C. Plasma glucose level 200 mg/dL (6.74% responses)

Diabetes mellitus (DM) is a group of metabolic disorders characterized by high blood sugar levels over a prolonged period of time. This is related to either deficiencies in the production of insulin by the pancreas or an impairment within the cells to absorb glucose from the blood. Symptoms often include frequent urination, increased thirst and increased appetite. If left untreated, diabetes can cause many health complications including diabetic ketoacidosis, hyperosmolar hyperglycemic state, coma or even death. Serious long-term complications include cardiovascular disease, stroke, chronic kidney disease, foot ulcers, damage to the nerves, damage to the eyes and cognitive impairment.

D. HIV positive test (0.71% responses)

HIV (human immunodeficiency virus) is a virus that attacks the body's white blood cells. It typically presents with fever, chills, rash, night sweats, fatigue, swollen lymph nodes, sore throat and myalgias. If not treated, HIV can lead to Acquired Immunodeficiency Syndrome (AIDS). After contracting HIV there may be a 10-15 year latency period before a progression to AIDS. HIV is not associated with cardiovascular hypertension.

E. Plasma renin 15 mg/mL/hr (CORRECT ANSWER, 84.4% responses)

This case represents a rare example of a secondary form of hypertension for which a cause can be determined. In this case, the decedent had an antemortem ultrasound that showed a significantly smaller left kidney, and a follow-up renal angiogram demonstrated a 90% focal stenosis of the left renal artery. Renal artery stenosis reduces glomerular blood flow and pressure in the afferent arteriole, resulting in renin release by juxtaglomerular cells. The renin initiates angiotensin II-induced vasoconstriction, increased peripheral vascular resistance, and increased aldosterone, which promotes sodium reabsorption in the kidney, resulting in increased blood volume leading to hypertension.

References:

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