Liver transplant, toxoplasmosis and kidney stones: connecting the dots

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DESCRIPTION

A 62-year-old woman with a history of orthotopic liver transplantation for cirrhosis secondary to auto-immune hepatitis 3 months prior, presented with fever and new-onset seizures. Her maintenance immunosuppressive therapy included mycophenolate mofetil 500 mg twice a day, tacrolimus 1 mg twice a day and prednisone 5 mg per day. Aerosolised pentamidine was being used for post-transplant *Pneumocystis jirovecii* prophylaxis instead of the standard therapy with trimethoprim-sulfamethoxazole because of recurrent episodes of serum creatinine elevation and hyperkalaemia in the immediate post-operative period. MRI of the brain demonstrated approximately 1.8×1.9×2.2 cm ring enhancing lesion in the right posterior frontal lobe with significant surrounding vasogenic oedema (figure 1). Cerebrospinal Fluid (CSF) analysis showed lymphocytic pleocytosis but was negative CSF toxoplasma polymerase chain reaction. Due to high clinical suspicion, ring enhancing lesion on MRI and positive toxoplasma serum IgG, she was diagnosed with cerebral toxoplasmosis and initiated on sulfadiazine 1000 mg every 6 hours, Pyrimethamine and Leucovorin.^{1,2} Repeat MRI of the brain 3 weeks after initiation of Sulfadiazine showed improvement in the size of the lesion and vasogenic oedema suggesting response to treatment and therefore, biopsy was not pursued. Around the same time, the patient developed gross haematuria, flank pain and mild acute Kidney Injury with a serum creatinine 1.3 mg/dL (baseline ~0.9). A renal sonogram

Figure 1 MRI of the brain demonstrating approximately 1.8×1.9×2.2 cm rim-enhancing nodule in the right posterior frontal lobe with surrounding vasogenic oedema (arrow) suggestive of cerebral toxoplasmosis.

Figure 2 (A) Renal sonogram 3 weeks after starting sulfadiazine demonstrating nephrolithiasis (arrows). Acoustic shadowing (asterisks) refers to the black area seen beyond the stones (structures that do not transmit ultrasound waves). (B) On doppler mode, stones exhibit twinkling sign, which is a rapidly alternating focus of colour Doppler signals mimicking turbulent flow (arrows). This sign is helpful when the shadowing is not apparent. LT, left; RT, right.

Learning points

- ▶ Toxoplasma polymerase chain reaction testing in the Cerebrospinal Fluid has high specificity but variable sensitivity depending on the primer used. Therefore, it would be prudent to proceed with the treatment when the suspicion for cerebral toxoplasmosis is high.
- ▶ Aerosolised pentamidine, which our patient was receiving is not recommended for Toxoplasma prophylaxis. The data on prevention of toxoplasmosis is sparse and trimethoprim-sulfamethoxazole at a dose of one double-strength tablet three times/week is thought to be sufficient for both *Pneumocystis* and *Toxoplasma* prevention.
- ▶ Sulfonamide antibiotics such as sulfadiazine are relatively insoluble in acid urine, especially when used in high doses to treat toxoplasmosis, which may lead to crystal-induced acute kidney injury (crystalline nephropathy) and/or nephrolithiasis from intrarenal drug precipitation. Alkalinisation of the urine to a pH more than 7.15 increases sulfadiazine solubility considerably.

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was obtained which showed non-obstructing bilateral renal stones with the classic acoustic shadowing and twinkling sign³ figure 2. She did not have known history of nephrolithiasis and review of CT of the abdomen prior to transplant confirmed the same. Urinalysis was significant for a pH of 5, 16 red blood cells per high power field and multiple hyaline casts. These findings were attributed to sulfadiazine-induced nephrolithiasis and the drug was transitioned to atovaquone.⁴⁻⁶ She was started on oral alkali supplementation to alkalinise the urine and her symptoms resolved in less than a week. A repeat renal sonogram obtained 6 months later demonstrated complete resolution of stones, retrospectively confirming the diagnosis of drug-induced nephrolithiasis.

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REFERENCES

- 1 Antinori A, Ammassari A, De Luca A, *et al.* Diagnosis of AIDS-related focal brain lesions: a decision-making analysis based on clinical and neuroradiologic characteristics combined with polymerase chain reaction assays in CSF. *Neurology* 1997;48:687–94.
- 2 Nogui FL, Mattas S, Turcato Júnior G, *et al.* Neurotoxoplasmosis diagnosis for HIV-1 patients by real-time PCR of cerebrospinal fluid. *Braz J Infect Dis* 2009;13:18–23.
- 3 Koratala A, Vangapalli A, Bhattacharya D, *et al.* Bladder stone: "must know" ultrasonographic signs. *Clin Case Rep* 2019;170.
- 4 Baden LR, Katz JT, Franck L, *et al.* Successful toxoplasmosis prophylaxis after orthotopic cardiac transplantation with trimethoprim-sulfamethoxazole. *Transplantation* 2003;75:339–43.
- 5 Hein R, Brunkhorst R, Thon WF, *et al.* Symptomatic sulfadiazine crystalluria in AIDS patients: a report of two cases. *Clin Nephrol* 1993;39:254–6.
- 6 Simon DI, Brosius FC, Rothstein DM. Sulfadiazine crystalluria revisited. The treatment of Toxoplasma encephalitis in patients with acquired immunodeficiency syndrome. *Arch Intern Med* 1990;150:2379–84.

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