ORIGINAL RESEARCH PAPER

Nephrology

TRIMETHOPRIM-SULFAMETHOXAZOLE INDUCED HYPERKALAEMIA IN A PATIENT WITH AIDS WITH NORMAL RENAL FUNCTION

KEY WORDS: Trimethoprim-sulfamethoxazole, Hyperkalaemia, Bradycardia

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ABSTRACT

The fixed dose combination of trimethoprim and sulfamethoxazole is called Cotrimoxazole. Trimethoprim is a diaminopyrimidine related to the antimalarial drug pyrimethamine which selectively inhibits bacterial dihydrofolate reductase (DHFRase). Sulfamethoxazole belongs to class of Sulfonamides. Nausea, vomiting, stomatitis, headache and rashes are usual manifestations. Hyperkalaemia is a known adverse effect of trimethoprim-sulfamethoxazole. We present a case of 60 year old female who went into symptomatic bradycardia after starting low dose trimethoprim sulfamethoxazole

Case Report

- 60 Year old female, Presented to Causality with complaints of palpitations. Patient was apparently alright 8 days back when she developed symptoms of cold. She was prescribed TMP-SMX for her upper respiratory tract infection and had completed eight days of the antibiotic course at the time of her arrival in the ED

Upon further enquiring patient complained of palpitations, bodyache associated with generalised weakness since 3 days. Upon examining patient vitals were of Pulse-40 bpm, Blood pressure of 110/80mmHg,Respiratory rate 28 cpm, Spo2-90% on RA.

Also, she was in moderate respiratory distress with tachypnoea and increased work of breathing. Her breath sounds were unremarkable except having rhonchi. Cardiac exam was unremarkable for any pertinent findings other than bradycardia. On neurological exam, there was no focal deficit; however, there was significant generalized weakness throughout, 4/5 strength in all extremities.

The patient's past medical history was significant for diabetes, hypertension, seropositive status, and hypothyroidism. Her current medications were Tab. Metformin and Vildagliptin, Tab.Dapaglifozin and metformin, Telmisartan, Lamivudin plus Tenofovir, Ritonavir plus Atazanavir, Levothyroxine Tab.Torsemide and Spironolactone 20/50 mg,. Her surgical and social histories were unremarkable and patient's husband was also seropositive.

Routine labs were sent , the results revealed a sodium level of 115, a potassium level of 8.3, a creatinine level of 1.02, a blood glucose of 231.Hemoglobin of 8.7, Total WBC count 13.9, Platelet 351.

The patient's 12-lead electrocardiogram (EKG) showed a idioventricular rhythm with bradycardia (Image 1)

The hyperkalaemia was treated immediately. Injection calcium gluconate 10% 10 ml in 100 ml normal saline. Followed by nebulization with salbutamol.Inj. HAI 12 Units in DNS Slowly over 3 hours. Post correction the potassium levels were 5.2. Patient was admitted in Intensive care unit and electrolytes were repeated after 6 hours and serum potassium was 7.5.Patient was still in bradycardia. The hyperkalaemia protocol was repeated.

A vascular catheter was placed in the patient's right femoral vein for emergent dialysis access,dialysis was performed, and her potassium level decreased to approximately 6. Overnight, the insulin infusion was continued. The next morning, the patient received another dose of K-bind Calcium Polystyrene Sulphonate 15gms. Throughout the day her potassium level trended downward and normalized between 4 and 5, and her ECG changes resolved.

12 hourly electrolytes were repeated on day2, and her renal ultrasound and 2D Echo were both within normal limits. It was determined that the patient's condition was due to TMPSMX-induced hyperkalaemia in the setting of daily Telmisartan 40 mg, and Tab.Torsemide and Spironolactone 20/50 mg.Patient was discharged after 6 days of hospital stay.

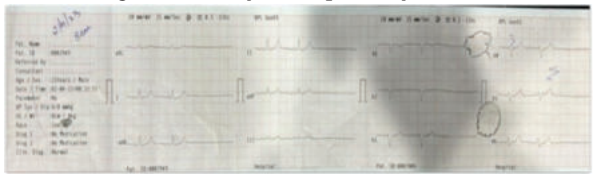

Image-1
Ecg On Presentation

DISCUSSION

Hyperkalaemia is defined as serum potassium above 5 mEq/L. Clinical features include cardiac arrhythmias, muscular weakness. It is most often linked to renal dysfunction like acute kidney injury, Severe chronic kidney disease but can also be seen in conditions like Addison's disease, Hyperaldosteronism, Haemolysis, Rhabdomyolysis or drugs causing impaired excretion of potassium or causing shift of potassium out of cell. Some of the most widely used medications have been implicated, such as mineralocorticoid receptor antagonists (spironolactone, eplerenone), potassium-sparing diuretics (amiloride, triamterene), angiotensin-converting enzyme inhibitors, angiotensin receptor blockers1, NSAIDs, heparin.

We focus on one drug in particular, TMP-SMX. Trimethoprim-induced hyperkalaemia were reported in patients with HIV/AIDS, these patients were typically treated with high doses of TMX-SMX for Pneumocystis carinii it was thought to be the declining renal function associated with TMX-SMX is responsible for the incidence of hyperkalaemia2. Other factors also have a role in TMX-SMX induced hyperkalaemia like Old age, Hypoaldosteronism, Concurrent medication that impair renal potassium excretion like ACE/ARB.

Trimethoprim-sulfamethoxazole (TMP-SMX) causes hyperkalaemia by blocking amiloride sensitive sodium

channels in the cortical collecting duct this leads to inhibition of sodium resorption and potassium excretion by TMP-SMX3. Hyperkalaemia as a side effect can be addictive when TMP-SMX is prescribed to patients with pre-existing conditions as mentioned above.

Trimethoprim-sulfamethoxazole (TMP-SMX) is still considered drug of choice in many conditions, Conditions mainly pertaining to immune compromised patients.Factors like baseline creatinine and electrolytes and follow up with electrolytes will help in minimizing such risk.

In conclusion, Physicians should be aware and watchful for such life threatening side effects and should consider monitoring electrolytes when prescribing to high risk group.

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