

Received: 2020.03.08

Accepted: 2020.04.15

Available online: 2020.04.29

Published: 2020.06.06

Underlying Serotonin Syndrome, Masked by Community-Acquired Pneumonia and Myocardial Ischemia

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

ABCDEF **Royale Lim**
AEF **Waqaar Arshad**

Department of Internal Medicine, Magnolia Regional Health Center, Corinth, MS, U.S.A.

Corresponding Author: Royale Lim, e-mail: royalelim@upike.edu

Conflict of interest: None declared

Patient: Male, 79-year-old
Final Diagnosis: Serotonin syndrome
Symptoms: Altered mental state • clonus • hyperthermia • rigors • tremor
Medication: —
Clinical Procedure: —
Specialty: Neurology • Psychiatry • Toxicology

Objective: Unusual clinical course

Background: Serotonin syndrome is a life-threatening condition that involves overstimulation serotonin receptors, which can be caused by medication overdose, drug-drug interactions, and regular doses of medications. It is often an overlooked diagnosis due to the presenting symptoms.

Case Report: Our patient was a 79-year-old man with a past medical history significant for coronary artery disease status after coronary bypass surgery who presented to the Emergency Department with altered mental status. Vital signs were significant for hyperthermia. On initial assessment, he was only oriented to person and demonstrated shaking rigors. Lab test results were significant for leukocytosis, with troponins 2.94. A chest X-ray revealed left lower-lobe opacification. He was initially treated for community-acquired pneumonia and his elevated troponin required further work up. He was moved to the Intensive Care Unit (ICU) due to worsening respiratory distress, shaking tremors, and confusion. His troponins remained elevated. On his third day of hospitalization, his rigors had improved, but clonus was present. A medication review revealed the patient was on sertraline. He was started on cyproheptadine. The next morning, his mental status had improved to alert and oriented, and his condition returned to baseline. Upon discharge to a rehab facility, sertraline was discontinued.

Conclusions: Serotonin syndrome is a condition that is often not initially recognized. Our patient had multiple health problems and presented with altered mental status and tremors, and serotonin syndrome was not recognized until a full neurological exam and medication review had been done. It is important for physicians to be aware of serotonin syndrome as a differential diagnosis, as the symptoms can be masked by other presenting symptoms.

MeSH Keywords: Community-Acquired Infections • Myocardial Ischemia • Serotonin Syndrome

Full-text PDF: <https://www.amjcaserep.com/abstract/index/idArt/924109>



793



—



—



8



Background

Serotonin syndrome is a life-threatening condition that involves overstimulation of serotonin receptors, which can be caused by medication overdose, drug-drug interactions, or regular doses of medications. This condition classically presents with vague symptoms such as diaphoresis, hyperthermia, agitation, tachycardia, and mydriasis. Neurologic symptoms, including hyperreflexia, clonus, and tremors, more prominent in the lower extremity, may also be seen [1]. Serotonin syndrome is often an overlooked diagnosis due to similarity of the presenting symptoms of other pathologies. It is especially difficult when patients present with other co-existing pathologies such as myocardial infarction and thyrotoxicosis [2]. To improve mortality associated with serotonin syndrome, it is important to consider the presenting symptoms so that prompt treatment can be provided.

Case Report

Our patient was a 79-year-old man with a past medical history significant for insulin-dependent diabetes mellitus and coronary artery disease status after coronary bypass surgery, who presented to our Emergency Department for altered mental status. Vitals significant for temperature of 100.9°F (38.2°C) and oxygen saturation 93% on 3-L nasal cannula. On initial assessment, he was only oriented to person and had shaking rigors. Lab test results were significant for white blood cell count 13.8, bands 8.0%, and hemoglobin 10.9. Bun/Cr was 38/1.4, creatine phosphokinase was 5608, glucose was 308, and HbA1C was 9.6%. Troponins were elevated at 2.94. A chest X-ray revealed left lateral 8–9th rib fractures with left lower-lobe opacification. A repeat temperature was elevated, at 102°F (38.8°C). He was initially treated for community-acquired pneumonia and his elevated troponin required further work up. During his stay, he was moved to the ICU with worsening respiratory distress, shaking tremors, and confusion. His troponin level remained elevated. On his third day of hospitalization, his rigors had improved, but clonus was detected on examination, and his temperature was elevated at 104°F (40°C). A review of his medications revealed that he was on sertraline. Serotonin syndrome was suspected at this time and cyproheptadine was started. The next morning, his mental status improved to alert and oriented. He stated that he did not remember the last few days. His temperature remained elevated at 101.1°F (38.3°C). Throughout the rest of his hospital stay, his condition was baseline and all his other comorbid problems were managed. Upon discharge to a rehab facility, sertraline was discontinued.

Discussion

Serotonin syndrome is a condition that is often not initially recognized. Our patient had multiple health problems and presented with altered mental status and tremors with concomitant signs of community-acquired pneumonia and myocardial ischemia from lab results. The patient was treated appropriately for these conditions; however, his confusion and tremors persisted. It was not until the third day of hospitalization that a full neurological exam and medication review was done. The patient had inducible clonus and was on sertraline, so serotonin syndrome was added to the differential diagnosis. Differentials included neuroleptic malignant syndrome, malignant hyperthermia, and anticholinergic toxicity [3]. NMS and anticholinergic toxicity were unlikely as the patient did not have any antipsychotics or anticholinergics on his medication list. He had no recent history of anesthesia, so malignant hyperthermia was also unlikely. Due to the patient's presentation of illness involving myocardial ischemia and community-acquired pneumonia, it was also important to consider delirium. There was no noted sundowning behavior and his exam findings significant for ankle clonus were more consistent with serotonin syndrome.

In this case presentation, the patient most likely had serotonin syndrome due to taking sertraline. It is possible that the patient had recently increased his dose. There have been reported cases of serotonin syndrome due to a single medication [4]. Additionally, there have been reported cases of serotonin syndrome associated with coronary artery disease and other heart disease [5]. Our patient met the requirements for diagnosis of serotonin syndrome using Hunter's criteria, as he had a history of serotonergic agent use, inducible clonus, hyperthermia, and tremor [6].

Initial management of the patient included lorazepam for control of tremors. Although serotonin syndrome was not suspected at the time, we appropriately discontinued his serotonergic medication [7]. Once serotonin was suspected on the third hospitalization day, cyproheptadine, a serotonergic receptor antagonist, was given. This situation should have also warranted consultation with a psychiatrist. The patient's tremors and altered mental status improved following the rest of his hospitalization. Considering delirium as a possible differential diagnosis for this patient, administration of cyproheptadine has been reported to improve this state [8].

Conclusions

We presented the case of a 79-year-old man who presented to the Emergency Department with altered mental status. In addition to his presenting problems and chronic medical

comorbidities, the patient was also suffering from serotonin syndrome. It is important for physicians to be aware of serotonin syndrome as a differential diagnosis, since the symptoms can be masked by other presenting symptoms.

References:

1. Boyer EW, Shannon M: The serotonin syndrome. *N Engl J Med*, 2005; 352(11): 1112–20
2. Takata J, Arashi T, Abe A et al: Serotonin syndrome triggered by postoperative administration of serotonin noradrenaline reuptake inhibitor (SNRI). *JA Clin Rep*, 2019; 5(1): 55
3. Volpi-Abadie J, Kaye AM, Kaye AD: Serotonin syndrome. *Ochsner J*, 2013; 13(4): 533–40
4. Ozdemir S, Yalug I, Aker AT: Serotonin syndrome associated with sertraline monotherapy at therapeutic doses. *Prog NeuroPsychopharmacol Biol Psychiatry*, 2008; 32(3): 897–98
5. Sato A, Okura Y, Minagawa S et al: Life-threatening serotonin syndrome in a patient with chronic heart failure and CYP2D6*1/*5. *Mayo Clinic Proc*, 2004; 79(11): 1444–48
6. Dunkley EJC, Isbister GK, Sibbritt D et al: The Hunter Serotonin Toxicity Criteria: Simple and accurate diagnostic decision rules for serotonin toxicity. *QJM*, 2003; 96(9): 635–42
7. Eisinger G, Botros M, Branditz L: Serotonin syndrome: When the happy hormone gets angry. In: Kaide CG, San Miguel CE (eds.), *Case studies in Emergency Medicine: LEARNing Rounds: Learn, Evaluate, Adopt, Right Now*. Cham: Springer International Publishing; 2020; 535–45
8. Mohammadi M, Ahmadi M, Khalili H et al: Cyproheptadine for the prevention of postoperative delirium: A pilot study. *Ann Pharmacother*, 2016; 50(3): 180–87

Conflicts of interest

None.