

When the Dragon Bites Back

Chief Complaint: I'm dizzy and having trouble walking, talking and concentrating.

HPI: 29-year-old male with PMH of opioid abuse, cigarette smoking (10 pack-year) and IVDU (heroin) presented to the ER with slowed speech, unsteady gait, and difficulty concentrating for the past 4 days. He denied any history of trauma, headaches, vision changes, focal weakness, or numbness. Patient reported that he stopped heroin use in 2018, but had switched to smoking pure fentanyl, aka "chasing the dragon", and reported that his last use was on the morning of his ER presentation.

Physical Exam:

Vital signs: BP: 141/91, HR: 93, Temp: 98.1F, RR: 20, Wt: 81.6 kg (180 lbs)

Appears stated age, NAD

HEENT: NCAT, EOMI, PERRL, MMM, no pharyngeal erythema

Chest: lungs CTAB, no r/r/w

Heart: normal S1S2, RRR, no murmurs

Abdomen: soft, NTND, normoactive BS

Ext: no edema

Neuro: AAO x 3, CN: II-XII intact, memory: intact, Muscle strength: 5/5 in all extremities, sensation intact, Romberg's test positive, finger to nose/heel to shin intact, supination intact, delayed speech, responds appropriately to questions but slowly

Questions

1. What is the most common complication of opioid overdose seen on neuro-imaging? How would these patients be treated?
2. For the above complications, is CT head without contrast sufficient to make the full diagnosis?

Answers

1. The most common complications seen on neuro-imaging are heroin induced leukoencephalopathy and micro-infarcts from septic emboli in the watershed areas of the brain. Leukoencephalopathy is primarily treated with supportive care. Septic emboli require IV antibiotics and neurology or neurosurgery involvement.
2. It is sometimes difficult for radiologists to differentiate the cause of infarct as due to a vascular issue or to CNS infection. As a result, many of these patients require additional imaging with MRI/MRA as part of their full workup.



Discussion

In recent years, there has been an increase in drug abuse and its associated complications, especially regarding opioid abuse. The isolation caused by the COVID pandemic has driven many susceptible individuals to relapse and/or increase their use. This translates to ER physicians seeing more overdose patients. As a result, we need to be cognizant of the complications that are less apparent and would require further imaging studies for diagnosis.

Per CDC data from 2014-2015, there was an increase in usage of fentanyl and its derivatives among patients suffering from addiction. In addition, drug dealers have also been using fentanyl as a method to amplify their heroin supply, resulting in fentanyl usage by unaware patients. Our patient had admitted to smoking fentanyl in a practice known as "chasing the dragon" among drug users. He then presented to our ER with neurologic deficits and was eventually found to have cerebellar infarcts. Two of the most common complications of opioid overdose seen on neuro-imaging are leukoencephalopathy and infarction secondary to septic emboli in the watershed areas of the brain. Our patient had bilateral cerebellar infarcts, which are rarely seen on imaging in patients who present after opioid overdose.

We are aware of the more common complications of opioid overdose, including respiratory depression, acute lung injury, endocarditis and other systemic complications. However, we do not readily think of cerebral infarct or leukoencephalopathy as part of our differential diagnosis of patients presenting with AMS or focal neurological symptoms after an overdose. We need to consider these complications and include them in our differential early on. When patients present with AMS secondary to drug abuse, we need to keep our differential broad and not just attribute the AMS to the effects of the drugs. We should perform a thorough physical and neurologic exam and have a low threshold for ordering further neuro-imaging to explain the AMS, especially since more studies are showing neurologic complications from drug abuse. Next time, when an overdose patient remains persistently altered or has unexplained neurologic complaints, consider re-examining the patient and in ordering other imaging studies.

Pearls

1. Not every case of AMS after drug overdose is secondary to direct toxin effect on the CNS. We must also consider CNS insult (e.g. infarct) from complications related to drug abuse as the cause of the patient's altered mentation.
2. This highlights the need for a comprehensive physical and neurologic exam (to the extent that can be performed) in our overdose patients. It also places emphasis on the need to re-evaluate these patients especially if they continue to be altered despite therapy or have persistent neurologic complaints.
3. Head CT without contrast many not be sufficient to fully workup or diagnose our overdose patients and we should consider the need for MRI/MRA.