CASE REPORTS

A UNIQUE CONSTELLATION OF SYMPTOMS DUE TO BACLOFEN TOXICITY IN A PREVIOUSLY WELL CHILD: A CASE REPORT AND LITERATURE REVIEW

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Abstract

We describe a previously healthy 5 year old girl who presented with acute onset of depressed mental status, new-onset seizure activity, mydriasis, bradycardia, hypothermia and respiratory depression. At the time that she started seizing, she fell and sustained minor head trauma. After stabilization in the emergency department and when the patient had returned to normal sensorium, she disclosed an ingestion of several pills forced on her by her older sister, identified to be another family member's Baclofen. In this report we describe the mechanism of Baclofen action, the risk of harm from Baclofen overdose or toxicity, and the importance of having a high index of suspicion for ingestion in cases that clinically fit the timeline for an ingestion or exposure event, even when there is initially no corroborating history.

Keywords: Baclofen, overdose, toxicity, seizure, mydriasis, bradycardia, bradypnea, hypothermia, depressed mental status

Introduction

Patients who present to the emergency room with decreased level of consciousness and seizure activity carry a diagnostic challenge as the differential diagnosis is wide and potentially life threatening. The differential includes intracranial lesions, increased intracranial pressure, trauma, arrhythmia, stroke, metabolic abnormality, epilepsy, and ingestion among others. Through careful attention to vital signs, obtaining a detailed history and physical exam one can narrow this broad diagnostic window. We describe a patient with a unique constellation of symptoms which fit with an unusual toxidrome: baclofen toxicity.

Case Report

A previous healthy 5 year old girl was found by her older brother to be stumbling in the hallway of her home early in the morning of presentation. She was taken promptly to her mother, who noticed that her eyes were dilated. Her mother asked her to follow a simple command, and in the process of trying to comply with this request, the girl fell forward and hit her head on the ceramic floor. At that time she started to have rhythmic jerking of all of her extremities. She no longer responded to voice or touch. Her eyes stared off into space. She was immediately rushed via ambulance to a nearby outside hospital. Her mother reports the seizure activity had resolved by the time EMS arrived. She had no prior medical/surgical history and was not taking any medications. She had no history of seizure-like activity in the past. Her mother reported that all of the household medications were kept in a locked safe, to which the patient did not have access. The medications were acetaminophen, an over the counter cold medication containing a combination of acetaminophen, dextromethorphan, and doxylamine succinate, polyethylene glycol 3350, and baclofen. Baclofen was prescribed for the patient's brother for spasticity secondary to cerebral palsy. The patient's mother had checked the bottles which appeared untouched and were locked in a safe. While there was no report of illicit substance use in the home, the patient's 17 year old sister was found to be using marijuana last year. On the day of admission the patient's family reported that their older daughter had been reported missing that day after running away from home with her boyfriend.

At the outside hospital, she was reported to have minimal response only to painful stimuli, and an initial Glasgow Coma Scale (GCS) of 6. Pupils were briskly reactive to light but dilated. Her initial vitals were blood pressure of 101/60 mmHg, heart rate of 69 beats/minute, respiratory rate of 13 breaths/minute. Temperature was 35.8 degrees C tympanic. Her alertness continued to wax and wane. Further work up included a head computed tomography scan demonstrating soft tissue swelling in the frontal area consistent with her fall that morning, and without intracranial bleeds or masses. At the outside hospital, investigations included an undetectable acetaminophen level, alcohol <6mg/dl, normal cerebrospinal fluid analysis. Urine drug screen was undetectable for benzodiazepines, cocaine, amphetamines, cannabinoids, opiates, barbiturates, methadone, phencyclidine. Urinalysis, complete blood count, and basic metabolic panel were within normal limits. Anion gap was normal at 12. She was given ceftriaxone at the outside hospital and transferred to our institution for further work-up and management of new onset seizure activity, depressed mental status and bradypnea.

On arrival to our hospital 3 hours following initial presentation, she was noted to have an initial GCS of 6. Initial vitals showed a low respiratory rate of 12 breaths/minute, heart rate of 70-80 beats/min, blood pressure of 97/63 mmHg, Temperature of 37.1 degrees C. After two hours, her respiratory rate spontaneously improved and heart rate increased to 100-110 beats/minute and subsequently over the course of 1-2 hours she became more alert without focal neurological deficit. A prolonged electroencephalogram completed 24-30 hours after the fall reported generalized diffuse slowing without seizure activity. The patient was at her normal sensorium 24-30 hours after the fall. She then recalled her sister giving her several round white pills early on the morning of presentation in hopes her sister would not report her running away. Her mother confirmed the pills were baclofen.

Discussion

Our patient had sudden onset mental status changes. While her constellation of symptoms and acute onset made ingestion high on the differential, it was important to rule out cranial anatomic abnormalities, infection such as meningitis, sepsis, urosepsis, acidosis, and new onset seizures. Our patient's history and clinical picture fit acute baclofen poisoning given her lack of prior medical history, resolution of symptoms

and presentation of acute onset of depressed mental status, seizures, mydriasis, bradycardia, hypothermia and respiratory depression. (1) Interestingly, other reports of Baclofen toxicity have described both brady- and tachycardia, hyper- and hypotension, and miosis as well as mydriasis. (2) Other findings of baclofen toxicity include depressed to absent reflexes. (2)

Baclofen has been used for a wide variety of neurologic conditions, including spasticity, stiff person syndrome, trigeminal neuralgia, cluster headache, intractable hiccups, tic disorder, gastroesophageal reflux disease, and cravings for alcohol, nicotine, and cocaine. (3) It is a derivative of gamma aminobutyric acid (GABA) and is a GABA-beta receptor agonist. It is lipophilic and thus readily penetrates the blood brain barrier and thus has been known to cause a wide array of nervous system symptoms as described above. (3) It is completely absorbed from the gastrointestinal tract reaching peak concentration in 2-3 hours. (4) Eighty-five percent of the drug is eliminated in its original form in the urine and feces, and 15% of the dose is metabolized by deamination. (4) The elimination half-life is 2-6 hours, and the drug is usually completely eliminated within 72 hours. (4) Baclofen's unique property of side effects includes both excitatory and inhibitory mechanisms which can provide clues that a patient is suffering from this toxidrome. (3) Seizure activity is attributed to baclofen's activity at the presynaptic GABA- beta receptors resulting in inhibition of GABA release. (4)

Baclofen toxicity can be diagnosed clinically. Though baclofen can be detected in serum using high performance liquid chromatography or gas chromatography/mass spectrometry technology, these methods are not routinely available. (3) Our patient had characteristic toxidrome consisting of mydriasis, bradycardia, respiratory depression, hypothermia and seizures. Current treatment in baclofen overdose includes respiratory, hemodynamic, and thermodynamic monitoring and support.

Conclusion

Clinicians should be aware of the unusual toxidrome of baclofen toxicity and keep it in differential diagnosis of any patient with acute onset depressed mental status.

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Conflict of Interest: None

References

1. Shannon MW. Emergency Management of Poisoning. In: Shannon MW, Borron SW, Burns MJ, (eds). Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose. 4th ed Saunders. Philadelphia, PA. 2007: chap 2
2. Sztajnkrycer MD. Muscle Relaxants. In: Shannon M, Borron SW, Burns MJ, (eds), Haddad and Winchester's Clinical Management of Poisoning and Drug Overdose. 4th ed Saunders. Philadelphia, PA. 2007: chap 37
3. Kohl MM, Paulsen O. The roles of GABA receptors in cortical network activity. Adv Pharmacol. 2010; 58: 205-229.
4. Perry HE, Wright RO, Shannon MW, Woolf AD. Baclofen overdose: drug experimentation in a group of adolescents. Pediatrics. 1998; 101: 1045-1048.

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SALMONELLA ENTERITIDIS - AN ATYPICAL PRESENTATION

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Abstract

We describe a case of a *Salmonella enteritidis* soft tissue infection, with cartilagineous involvement of the sternum in an immunocompetent young infant.

Introduction

Salmonella enteritidis is primarily a self-limited intestinal infection. However focal extra-intestinal syndromes have been increasingly reported since the early 1980s. (1,2) The most common manifestations are osteomyelitis or meningitis, usually with bacteraemia, after gastrointestinal symptoms. Salmonella soft tissue infection is rare, and occurs more frequently in adult immunocompromised hosts. (1,3) We describe a case of a *Salmonella enteritidis* soft tissue infection, with cartilagineous involvement of the sternum in an immunocompetent young infant.

Case Report

A 2 months-old infant, previously healthy, was admitted for high fever, poor feeding and irritability with 12 hour evolution. The child was breast and bottlefeeding and a prior history of a self-limited episode of diarrhoea 15 days earlier was also reported. There was no history of travel or exposure to pets. On admission, she appeared ill, irritable, had normal anterior fontanel, impaired peripheral perfusion but was hemodynamical stable and had no localizing signs of infection on physical examination. Her vital signs were: temperature 39.5oC, blood pressure 95/60 mmHg and pulse rate 148 beats per min. The abnormal laboratory findings included white blood cell count of 8,300 cells/cumm, absolute neutrophil count 6947/cumm and C-reactive protein of 13.18 mg/dl. Hemostasis, cerebrospinal fluid analysis and urinalysis were normal. Based on clinical presentation and initial laboratory results, the child was hospitalized with clinical diagnosis of occult bacteraemia. Intravenous ceftriaxone (100 mg/kg/once a day) and ampicillin (100 mg/kg/day every 6 hours) were prescribed. On the third day after admission, a round cutaneous lesion (4x4 cm) over the xyphoid process of the sternum was noted. This lesion was painful and local signs of inflammation were present. Ultrasound examination revealed a hypoechoic lesion over the anterior wall of the sternum that was 30X30 mm in size. Chest CT scan confirmed an abscess formation without bone involvement. Flucloxacillin was substituted for ampicillin, due to a concern for staphylococcal disease. Incision and drainage was performed on the sixth day. A 4 cc purulent exudates was aspirated and, macroscopically, irregularity of the anterior cartilagineous wall of the sternum was seen. *Salmonella enteritidis* susceptible to ampicillin and ceftriaxone was isolated from the exudates as well as from the initial blood culture. Technetium bone scan was performed and no evidence of osteomyelitis was found. Hemoglobin electrophoresis showed absence of HbS. Serum IgG (658 mg/dl), IgM (44.0 mg/dl), IgA (52.1 mg/dl), IgG1 (639.0 mg/dl), IgG2 (107 mg/dl), IgG3 (80.0 mg/dl), IgG4 (15 mg/dl), complement C3 fraction (97.10 mg/dl), complement C4 fraction (12.8 mg/dl), CH100 activity (520 U/ml), lymphocyte count (5200 cells/cumm) CD19 (15%) CD4 (39.9%), CD8 (21.0%) were normal. Oxidative function of neutrophils (266.7) and phagocyte function of neutrophils (95.9%) were also normal. After the Salmonella isolation, a cultural sample of the faeces was performed from the patient and from her parents and sister which were negative.

The child was discharged on the eighteenth day on oral amoxicillin which was given for a total of six weeks. Six months later she was symptom free with no evidence of recurrence.

Discussion

In our review from the literature we did not find any chest wall abcess caused by *Salmonella enteritidis* in an immunocompetent infant. A similar abscess due to *Salmonella enteritidis* was reported by Minohara et al (3) in a healthy 6 year old boy and by Gupta et al (1) in a healthy adult. The incidence of salmonella infection is greatest among children younger than 5 years of age, with a peak incidence among those younger than one year. (2) Infants and elderly population tend to have more severe infections. (4)

Salmonellosis in children may manifest as acute or chronic asymptomatic infection (carrier state). Symptomatic infections include gastroenteritis, enteric fever and bacteraemia, with or without focal suppuration. (5) Aproximately 5% of individuals with gastrointestinal symptoms caused by nontyphoidal salmonella will develop bacteraemia (4), but Hyams et al (6) did not find clinical and laboratory data to predict which patients were more likely to have bacteraemia on initial presentation.

In general population, focal suppurative extra-intestinal complications occur in 10% of the bacteraemia cases. (7) They can occur in any localization, but the most common sites are the bones and the meninges. (2) Salmonella abscesses are rare and occur most frequent in the proximity of the gastrointestinal tract (3). Associated risk factors for developing extra-intestinal salmonella infection are: age less than 3 months, anterior gastrointestinal surgery, an immunocompromised condition, sickle cell disease and severe malnutrition. (8,9)

In the present case, *Salmonella enteritidis* was isolated from blood and pus, confirming a systemic infection distant from the gastrointestinal tract. The only risk factor identified in the infant was her age.

Transmission of salmonella to a susceptible host usually occurs by consumption of contaminated products, however Sramova et al (10) described sporadic cases in children under 2 years of age, where direct and indirect contact may have participated in the transmission of the infection. Our child was both on breast and botttlefeeding, and neither of her family members had salmonella in the cultural

examination of the feces. Although a self limited episode of diarrhea has been described 15 days prior to her hospital admission, we could not confirm the possible source of infection. As most focal extra-intestinal infections described in the literature have a prior intestinal infection (1), we can speculate that the infant episode of diarrhea was the initial focus of infection. We think that a sub-clinical abscess of the sterna region soft tissues could have been present ab initio preventing antibiotics from reaching it due to hypoperfusion of cartilagenous tissue. That fact could explain the subsequent worsening of local infection, in spite of prompt initiation of antibiotics to which the agent was susceptible. We also believe that these facts (hypoperfusion and adequate therapy) prevented involvement of the sternum bone.

This patient had a *Salmonella* extraintestinal localized cartilagineous infection and was treated with a narrow spectrum antibiotic to which the identified strain was susceptible. The fact that patient had an abscess justified a six week duration of therapy, as recommended in the literature. (5,8,9)

References

1. Gupta SK, BarrosD'sa S, Evans PD, White DG. Anterior chest wall abscess caused by Salmonella enteritidis in a healthy adult. Infect J 2003; 46:142 - 143.
2. Porcalla AR, Rodriguez WJ. Soft tissue and cartilage infection by salmonella oranienburg in a healthy girl. South Med J 2001; 94: 435 - 437.
3. Minohara Y, Kato T, Chiba M et al. A rare case of Salmonella soft-tissue abscess. J Infect Chemother 2002; 8:185 - 186.
4. Hohmann EL. Nontyphoidal salmonellosis. Clin Infect Dis 2001; 32: 263 - 269.
5. Cleary TG Salmonella in Feigin D, Cherry JD Eds Texbook of Pediactric Infectious Diseases. 5th Ed, Philadelphia, WB Saunders Co, 2004: 1473 - 87
6. Hyams JS, Darbin WA, Grand RJ, Goldmann DA. Salmonella bacteremia in the first year of life. J Pediatr 1980; 96: 57 - 59
7. Blasco AC, Valdivieso MFB, Ayala MIA. Infecciones focales por Salmonella no typhi: revision de nuestra casuitica y comparacion con otras series. Rev Clin Esp 1992; 191: 71 - 75.
8. Schutze GE, Schutze SE, Kirby RS. Extraintestinal salmonellosis in a children's hospital. Pediatr Infect Dis J.1997 ;16:482 - 485.
9. Lee WS, Puthucheary SD, Parasakthi N. Extra-intestinal non-typhoidal salmonella infections in children. Ann Trop Paediatr 2000; 20: 125 - 129
10. Sramova H, Karpiskova R, Dedicova D. Salmoenllosis in children under 2 years of age. Epidemiol Mikrobiol Imunol 1998. 47:56 - 61.

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