Unexpected Cause of Neonatal Seizure: In Utero Heroin Exposure

Yenidoğan Konvülsiyonunun Nadir Bir Nedeni: İntrauterin Eroin Maruziyeti

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ABSTRACT

Infants exposed to some drugs in utero can become physically dependent and neonatal abstinence syndrome (NAS) may develop after the delivery. NAS causes multi-system dysfunction related to central nervous, gastrointestinal and respiratory systems. The incidence of NAS is 16-90% in infants of heroin-addicted mothers. Clinical signs usually occur within 48-72 hours following birth. In this study, we present a newborn who had neonatal seizures and was treated successfully with phenobarbital and levetiracetam. When his non-convulsive insistent jerky movements did not stop and were followed by convulsion, further evaluation showed in utero heroin exposure. Opiate or other drug withdrawal should be considered in the differential diagnosis of early neonatal seizures or insistent jerky movements on the 3rd or 4th day of life, even if there is no given past history.

Key Words: Seizure, neonatal abstinence syndrome, heroin, opiate

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ÖZET

İntrauterin hayatta bağımlılık yapan maddelere maruz kalan infantlarda, doğum sonrası çekilme semptomları ve fiziksel bağımlılıkla karakterize yoksunluk sendromu gelişebilir. Neonatal yoksunluk sendromunda sıklıkla merkezi sinir sistemi, gastrointestinal sistem ve solunum sistemi etkilenmektedir. Eroin bağımlı annelerin bebeklerinde neonatal yoksunluk sendromu sıklığı %16-90'dır. Klinik bulgular genellikle ilk 48-72 saat içerisinde ortaya çıkmaktadır. Bu makalede intrauterin eroin maruziyeti nedeniyle konvülsiyon geçiren ve fenobartbital ve levetirasetam ile başarı ile tedavi edilen bir olguyu takdim edeceğiz. İzleminde jitterines benzeri hareketleri konvülsiyonun takip ettiği hastanın ileri değerlendirilmesi sırasında intrauterin eroine maruz kaldığı tespit edildi. Hayatın 3 veya 4. Gününde açıklanamayan jitterines ve konvülsiyon varlığında ayırıcı tanıda opiyat ya da diğer maddelere bağlı neonatal yoksunluk sendromu olasılığı akılda tutulmalıdır.

Anahtar Sözcükler: Konvülsiyon, neonatal yoksunluk sendromu, opiyat

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INTRODUCTION

Neonatal abstinence syndrome (NAS) is a condition characterized by central nervous, respiratory and gastrointestinal system findings. Excessive crying, irritability, increased muscle tone, tremors, loose stools, and sweating are the common signs. In addition, convulsions can occur in 2-11% of cases. Withdrawal symptoms of heroin are known to begin at 24-48 hours of life, buprenorphine 36-60 hours of life, and methadone 48-72 hours of life. The pathophysiology is still unknown, but altered levels of neurotransmitters such as norepinephrine, dopamine and serotonin can be responsible (1).

In this case report, we present a newborn who had neonatal seizures and was treated successfully with phenobarbital and levetiracetam. When his non-convulsive insistent jerky movements did not stop and were followed by convulsion, further evaluation showed that he had been exposed to heroin in utero.

CASE REPORT

A male infant was born by vaginal delivery at 36 weeks gestation, with a birth weight of 1,710 grams. He was considered a small baby for his gestational age, defined as below 10th percentile for gestational age according to the Fenton growth chart. He was admitted to neonatal intensive care unit (NICU) because of respiratory distress and was put on Nasal Continuous Airway Pressure for one day. On the fourth day of life, jitteriness which was triggered by sound and touch was noticed. Although blood glucose, calcium, sodium, potassium level and transfontanelle ultrasonography were all normal, the frequency and duration of jitteriness increased, and moro reflex became exaggerated. On the 10th day of life seizures were noticed, but blood glucose, calcium, sodium, potassium levels and transfontanelle ultrasonography were all normal again.

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Blood gas values, ammonia levels and tandem mass spectrometer results were all within normal limits. The echocardiography and electrocardiography of the infant was normal. Phenobarbital was started (20 mg/kg loading dose, 4 mg/kg/day maintenance dose). However, generalized seizures continued so levetiracetam was added and the seizure activity stopped. The electroencephalography performed on the second day of treatment was normal. Then the mother confessed that she was heroin addicted for the past seven years, and had used heroin intranasally and also smoked three packs of cigarettes during the whole pregnancy. The symptoms of the infant were attributed to heroin withdrawal. The urine of the mother was positive for heroin, but the urine of the infant was negative. Symptoms regressed with phenobarbital and levetiracetam, firstly we discontinued levetiracetam and then phenobarbital by decreasing the dose every few days. The baby was discharged on the 26th day of life (Videos 1 and 2).

DISCUSSION

NAS is a combination of withdrawal symptoms that develops postpartum in infants exposed to certain drugs in utero (2). Infants born to heroin-addicted mothers are usually premature, have low birth weight and are often growth restricted (3). Our case is also premature and growth restricted compatible with the literature. No teratogenic effect of opioids in exposed newborn infants have been demonstrated yet (4). Our case was exposed to heroin throughout all the pregnancy, including the embryonic stage, and we did not observe any teratogenic effect either; echocardiography, abdominal and transfontanelle ultrasonography of the infant were all normal. The American Academy of Pediatrics (AAP), recommends use of standardized tool such as Finnegan abstinence assessment for evaluation of NAS (2). Infants are scored every 3-4 hours and monitored for 5-10 days for signs of withdrawal. If an infant's score ≥8, then pharmacological therapy is started. There are currently no FDA-approved medications for NAS, however AAP recommends use of oral morphine solution or methadone as the first-line medication. Second-line agents including phenobarbital, clonidine and clonazepam are used for more severe conditions along with first-line medications (5). Non-pharmacological treatment should be used in all infants with NAS for decreasing clinical symptoms and need for pharmacological therapy. Supportive options include swaddling, limiting exposure to sounds and light, maintaining temperature stability, increasing the frequency of feeds and achieving a caloric intake of 150 to 250 kcal/kg/day (5). We did not use Finnegan score or any others because we did not know that the mother was heroin addicted at the beginning. We started pharmacotherapy with phenobarbital and added levetiracetam for neonatal convulsion, not for NAS. At the time we learnt the mother was heroin addicted and that the convulsion was the sign of NAS, it was already under control with phenobarbital and levetiracetam. We weaned and then stopped levetiracetam and phenobarbital respectively. The general recommendation for breastfeeding born to drug addict mothers is that infants should be breastfed if the mother is enrolled in a substance abuse program (6). Our patient was not breastfed, as the mother was still an active drug user and was not in a substance abuse program.

The clinical symptoms of NAS are high-pitched crying, restlessness, hyperreflexia, jitteriness, hypertonia, myoclonic jerks, convulsions, frequent yawning, sneezing, nasal flaring, tachypnea, excessive sucking, poor feeding and vomiting. The symptoms of the present case were high-pitched crying, restlessness, hyperreflexia, jitteriness and convulsion. Heroin withdrawal occurs within 48-72 hours after birth (7). Jitteriness and restlessness in the present case began on the 4th day of life, and convulsion was noticed on the 10th day of life; later than stated in the literature.

Two basic methods are used to identify drug users: self-report or biological specimens. The three most commonly used specimens to establish drug exposure during prenatal and perinatal period are urine, meconium and hair, but none of them is accepted as a 'gold standard'(8). In our case, it was self-reported and also demonstrated in urine.

NAS must be kept in mind as a potential cause of neonatal seizure on the 3rd or 4th day of life, especially if no cause for seizure is identified. The common pharmacotherapy of opioid withdrawal is morphine or methadone however our case was treated with phenobarbital and levetiracetam where levetiracetam was used as an adjunctive drug and facilitated the treatment of the NAS symptoms and seizures successfully.

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Conflict of interest

No conflict of interest was declared by the authors

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