

# HYPEREKPLEXIA AND EXCESSIVE STARTLE RESPONSE IN AN INFANT: A CASE REPORT

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## ABSTRACT

We present an infant girl with hyperekplexia, hypertonia, hyperreflexia and a characteristic exaggerated response to nose tap. This disorder is important to recognize because of the increased risk of apnea and sudden infant death. This infant responded to clonazepam.

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## INTRODUCTION

Hyperekplexia is a rare familial disorder associated with whole body myoclonus presenting as a hyperactive startle reflex which occurs during the neonatal or early infancy periods. When handled, a minority of infants become stiff with severe hypertonia leading to apnea and bradycardia. These movements must be distinguished from startle epilepsy. Prognosis is variable, and seizures do not accompany the benign form of this disorder. Clonazepam or valproic acid may be useful.

## CASE REPORT

A 45 day old infant girl suffering from seizure like episodes was admitted in the pediatric ward of Imam Reza Hospital of Mashhad University of Medical Sciences. The infant was born by normal vaginal delivery and her weight was 3300 grams. On the first day she was admitted to the nursery and treated with phenobarbital and phenytoin because of seizures. But there was no response and after a few days her mother took her home. Her gestation, labor and delivery were unremarkable and Apgar scores were 7 at 1 minute and 9 at 5 minutes. On examination, the infant was alert, and attention and movements were appropriate for her age. Head circumference was normal

and present weight was 3700 grams. Gag and sucking of this child seemed to be hyperactive. Touching the child's face produced an immediate head recoil with extension of the limbs. Tapping the nose appeared to be the most effective method of eliciting the head recoil. Tone was symmetrically increased and ankle clonus was present. Deep tendon reflexes were increased. Feeding was difficult because touching the breast to her mouth elicited the head recoil response. Tremor of the limbs was elicited by touch, a loud sound, or by shining light in the infant's eyes. The asymmetric tonic neck reflex was normal. Brain CT scan and electroencephalogram, formerly performed, were normal. After diagnosing hyperekplexia and startle response clonazepam was begun which immediately improved these movements and feeding. The baby was discharged after a week. Social and cognitive function were normal at 4 and 10 months of life but gross motor development was mildly delayed and remained slightly hypertonic. At the age of 16 months she was able to walk.

## DISCUSSION

Hyperstartle syndrome (or Hyperekplexia) is a neurologic disorder characterized by hypertonicity, tremor, and exaggerated response to tactile, auditory and visual stimulation. Two clinical groups of this syndrome have been proposed.<sup>1</sup> Major hyperekplexia is the term proposed to describe patients with the following features: hypertonicity in infancy, excessive startle response, startle induced falls without loss of conscious-

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ness, episodic generalized shaking, generalized hyperreflexia, and insecure, hesitating gait. In some patients the exaggerated startle response is not accompanied by hypertonicity; this has been termed "minor hyperekplexia". Severity of symptoms is variable among patients. Startle induced falls may start as soon as the infant learns to walk and injury is common. Sleep myoclonus may be marked. Cranial nerve function is usually normal but some patients have slow saccadic eye movements.<sup>2</sup> Emotional states, such as anxiety, heighten the tendency to startle.

The hallmark of this disorder is a failure of the startle response to habituate and in many patients repeated stimuli elicit a greater response (sensitization). Some authors have stated that CNS insults cause the loss of inhibitory control of the startle generators who had a lower threshold for this response.<sup>3</sup> Hypokinesia of the face may be severe. Onset of symptoms varies from infancy to late adulthood. One patient with abnormal fetal movement has been reported.<sup>4</sup>

Hypertonicity is present in the newborn period and may result in apnea, but it tends to slowly improve over the first years of life, and tone is usually normal by adulthood. Walking may be limited also by startle induced falls. Inguinal and umbilical hernias commonly develop during the first year of life, probably because of prolonged and recurrent hypertonicity interfering with maturation of the abdominal muscles.<sup>5</sup> Cognitive development is usually reported as normal.<sup>6</sup> Electroencephalograms are nearly always normal, but rarely epileptiform discharges may be seen.<sup>7</sup> Electromyography may help for diagnosis.<sup>2</sup>

Although many authors have stated that hyperekplexia is a benign condition that resolves or at least substantially improves in the first decade of life, other reports have emphasized that neonatal apnea and even sudden infant death occur in this disorder. Fifteen patients with hyperekplexia from three families were described by Nigro and Lim.<sup>8</sup> Infants experienced recurrent apnea during the first year of life that was successfully treated with clonazepam. Three untreated patients died unexpectedly during the neonatal period. These authors recommended that affected infants and all infants born to families known to have hyperekplexia be closely observed in the nursery for respiratory failure after birth. In affected infants home apnea monitoring during the first year of life should be considered.

Hyperekplexia may occur sporadically (our patient) or be inherited in an autosomal dominant manner with the gene localized to the arm of chromosome 5. As a consequence of the mutation, there is a defect in the  $\alpha 1$  sub-unit of glycine receptor.<sup>9</sup>

Treatment of hyperekplexia is usually satisfactory with one of the benzodiazepines, which act as gamma

aminobutyric acid (GABA) agonists. Clonazepam is more effective than other drugs such as: valproate, pyridoxine, phenobarbital and vigabatrin in decreasing startle tendency.<sup>10,11,12</sup> Our patient was well treated with clonazepam. Lim and Nigro recommend starting clonazepam at 0.1 to 0.2 mg/kg/day in infants.<sup>8</sup>

Exaggerated startle and hypertonicity occur in many conditions, i.e. hypoxic ischemic encephalopathy, increased intracranial pressure, neonatal tetany, strychnine poisoning, Schwartz Jampel syndrome, phenothiazine toxicity, and stiff baby syndrome. Most of these conditions are easily ruled out by clinical history, examination, and with direct laboratory testing.

In summary, hyperekplexia may present in the newborn period with hypertonia, hyperreflexia, and a characteristic exaggerated response to nose tap. This disorder is important to recognize because of the increased risk of apnea and sudden infant death. Most infants respond to clonazepam and close follow up is recommended.

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