Acute flaccid paralysis in a neonate: tick bite a differential?

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Abstract

Tick paralysis is an uncommon, noninfectious, neurologic syndrome characterized by acute ataxia and ascending paralysis mostly seen in children. Early recognition and prompt management with tick removal helps in complete recovery. If untreated, ascending paralysis can lead to respiratory failure and death in 10% of the cases. Tick paralysis is usually considered as a differential in all cases of acute ataxia and generalized weakness in children and adults but seldom in neonates due to its rarity and differences in clinical presentation in the newborn period. In neonates, tick paralysis may present only as generalized weakness and lethargy with poor feeding. Even though tick paralysis is common in children <10 years of age, it has never been reported in a neonate. We report a case of tick bite paralysis in a baby who presented in the neonatal period, and identification of the tick and its removal that helped in rapid recovery.

INTRODUCTION

Tick paralysis is caused by nearly over 40 species of ticks worldwide and can occur in almost any region where ticks are found. Tick paralysis in humans is rare and usually occurs in children under the age of 10, but has never been reported in the early neonatal period [1, 2].

Tick paralysis occurs when an engorged and gravid (egg-laden) female tick injects the neurotoxin present in its saliva into the host during feeding. Tick paralysis is toxin induced and therefore continues only in its presence. Once the tick is removed, symptoms usually diminish rapidly. However, in some cases, profound paralysis can develop and even become fatal if a tick’s presence is missed and not completely removed. The tick bites are most often found at the head and often at the hair lines behind the ears and in the skin folds. The clinical presentation may start between 2 and 7 days after the bite and appears as typical ascending flaccid paralysis in children and poor feeding and/or lethargy in neonates. After a prodromal phase, neurological symptoms begin with paralysis of the lower extremities along with weak/absent deep tendon reflexes. Paralysis progresses over few hours to a day to involve the upper extremities, cranial nerves and respiratory muscles. If the tick is not identified, located and removed it may lead to death due to respiratory failure. Sensory findings are generally absent and therefore form an important differential diagnosis in motor neuropathies such as Guillain-Barre syndrome, infant botulism and diphtheria. In tick bites mental status is typically normal and fever is absent.

Tick bites in early neonatal period have never been documented [3–6]. We describe the first case of tick paralysis in the early neonatal period.

CASE REPORT

A male baby was delivered in a primary health center at term gestation via normal vaginal delivery and weighed 2.5 kg. He cried at birth, did not require any resuscitation and was discharged on Day 2 of life. On Day 3 he was diagnosed with
neonatal hyperbilirubinemia (total bilirubin: 20.6 mg/dl and direct bilirubin: 0.6 mg/dl) and hence was referred to our center. We started intensive phototherapy. He was discharged on Day 5 of life with normal bilirubin levels (total bilirubin: 9.6 mg/dl and direct bilirubin: 0.3 mg/dl). On Day 9 of life parents brought the newborn to our center with complaints of poor feeding, lethargy and reduced activity since 6 h, and with yellowish discoloration of hands and legs since 2 days. On examination it was found that the baby was hemodynamically stable (heart rate: 120 beats per minute, peripheral pulses: well felt, capillary refill time: < 3 s and warm peripheries) with normoglycemia (Random blood sugar: 98 mg/dl) and normal body temperature (36.6°C). Icterus was noted till knees and elbows with no evidence of bilirubin-induced neurological dysfunction (BIND). Neurological examination showed drowsiness and lethargy. Glasgow Coma Scale score was nine (eye opening on pain, withdrawing from pain and crying to pain). Pupils were equal and reactive. Anterior fontanelle was level with normal cry. Poor latching and sucking was noted. Generalized hypotonia of all four limbs was noted with a poor respiratory effort. Deep tendon reflexes were hyporeactive. No seizures or neck retractions were noted. No cranial nerve deficits were noted.

Blood investigations revealed hemoglobin: 15.8 gm%, total count: 7300 cells/cumm, differential count: neutrophils (63%), lymphocytes (37%), platelet count: 2.9 lakh/cumm, C-reactive protein: 0.5 mg/l, total bilirubin: 12 mg/dl, direct bilirubin: 0.4 mg/dl, sodium: 138 mEq/l, potassium: 4.8 mEq/l, total protein: 5.5 gm/dl, albumin: 3.5 gm/dl, AST: 30u/l, ALT: 36 u/l and GRBS: 98 mg/dl.

We admitted the baby to the Neonatal Intensive Care Unit where a re-examination was done. An engorged tick was found attached under the chin of the baby. The tick was removed by grasping it with forceps close to the body and pulling it out with steady upward outward pressure. No part of the tick was left behind. The tick was found to be of Haemaphysalis species which is common in this area [7]. With the removal of the tick, the baby improved dramatically within few hours. We started maintenance fluids until breast feeding was re-established. Although incidence of Lyme disease is low in India, we initiated a prophylactic dose of amoxicillin for 14 days. Baby was discharged after 3 days of in-patient care and was kept on follow-up since incidence of Kyasanur Forest disease is high in our region. Kyasanur forest disease is a tick-borne viral hemorrhagic fever endemic to south-western part of India. On follow-up after 2 weeks the baby was doing well and gaining weight.

DISCUSSION

Studies carried out by Prakasan et al. [7] suggested Haemaphysalis species belonging to the ixodes tick genus is the most prevalent among domestic animals in Wayand district of Kerala. Signs and symptoms of tick paralysis have generally been described in older children and adults and never in a neonate [2, 3, 5]. A recent case report by John et al. [9] identified an ixodes tick in a 4-year-old child with eyelid swelling. The symptoms usually begin with fatigue, poor feeding and lethargy. Ascending paralysis rapidly progresses within hours to 1 day to involve the upper extremities, cranial nerves and respiratory muscles. If the tick is not removed in time, it can be fatal due to respiratory failure. Sensory changes are typically rare and the mental status is normal. Fever is typically absent. There is no toxin assay and imaging is normal. Because of these reasons the diagnosis is clinical. Rapid improvement of the patient once the engorged tick is removed should confirm the diagnosis. Treatment involves simply removing the feeding tick. It is important to remove all the mouthparts, since they contain the salivary glands which may continue to intoxicate the patient even after the main body of the tick has been removed.

Tick bites in neonates mimic clinical signs and symptoms typical of other neonatal infections like fever/hypothermia, irritability and poor feeding. Tick-borne intoxication should therefore be considered when a neonate coming from an endemic region has clinical findings suggesting neonatal infections with normal blood counts. Neuropathies such as Guillain Barre Syndrome, infant botulism and diphtheria should also be ruled out. History of witnessed tick bites and recent family or pet exposures to ticks provide helpful information. Examination findings may reveal diagnostic clues. Variety of skin rash may develop at the bite site. Identification of a tick is typically adequate to diagnose.

Much remains unknown about neonatal tick-borne infections. The signs and symptoms in our patient who presented with a short clinical course, lack of clinically validated tests for tick-borne intoxication (tick toxicosis) in the neonatal period and rapid improvement on removal of the tick tell us about the importance of a thorough clinical examination in similar situations. In presenting this case, we aim to provide guidance to other clinicians.

CONCLUSION

As tick-borne infections become more prevalent, we expect other clinicians will face similarly challenging neonatal cases. Providers must use past experience and a keen eye to identify ticks in neonates to rule out other conditions with similar presentation. Delayed diagnosis is detrimental and so early treatment is very necessary to prevent a critical outcome.

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ABBREVIATIONS

1. AST: Aspartate aminotransferase
2. ALT: Alanine aminotransferase
3. GRBS: General random blood sugar
AUTHOR CONTRIBUTION

V.J., J.R. and S.R. conceptualized and designed the study, drafted the initial manuscript, did literature review and revised the manuscript. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

CONSENT

Written consent obtained.

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