

A Neonate with Hypernatremic Dehydration

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Abstract

Background: Hyper-natremic dehydration is a rare clinical entity usually encountered in breast fed neonates. Early post-partum discharge with lack of knowledge about techniques and adequacy of breast feeding in mothers has been implicated as a major risk factor. **Case Report:** We report a case of a 13 days old exclusively breast fed neonate who presented with weight loss, dehydration, poor feeding, lethargy and decrease urine output. Child was managed with intravenous fluids and breastfeeding counseling. **Conclusion:** There is an urgent need to foster a greater awareness of this problem among lactating mothers and health care professionals to prevent disastrous complications.

Keywords: Breastfeeding, Dehydration, Infant, Lactation, Postpartum Period.

Introduction

Despite the rare occurrence of hyper-natremic dehydration in neonates, number of cases have been reported with fatal outcome. There is no consensus so far on patho-physiology of this condition but early postpartum discharge with lack of knowledge about techniques and adequacy of breast feeding in mothers has been proposed as a major risk factor [1]. An early diagnosis is absolutely warranted in this clinical condition as delay may result in irreversible neuronal insult [2].

Case Report

A 35 years old second gravida delivered 40 week male neonate with birth weight of 3 kg by emergency cesarean section in view of meconium stained liquor. Baby cried after birth with uneventful post-natal period and was discharged on day five of life on exclusive breast feeding. On day 13 of life, baby was brought to the hospital with history of poor feeding, lethargy and decrease urine output of one day duration.

Baby was on exclusive breast feeds with no history of diarrhea or vomiting. Physical

examination was suggestive of a sick looking neonate with irritability and moaning sounds. Baby looked emaciated with weight of 2.1 kg (significant weight loss of 30% since birth). His heart rate was 160/min with poorly felt peripheral pulses and prolonged capillary refill time (>3 sec). Axillary temperature was 97.2°F with respiratory rate of 43/min. Neurological examination revealed moaning sounds, hypotonia with poorly elicitable neonatal reflexes. The baby was admitted in neonatal intensive care unit with strong clinical suspicion of sepsis with features of hypovolemia. Baby didn't have any history of seizures.

Sepsis screen showed CRP (C-reactive protein) negative, hemoglobin: 15.3 g/dL, total leukocyte count: 10,200/mm³ (polymorphs 41%, lymphocytes 52%), platelets 2,10,000/mm³ and blood sugar 89 mg/dL. Blood urea and creatinine were 200 mg/dL and 2.8 mg/dL respectively at the time of admission. Serum electrolytes were deranged with sodium 178 mg/dL and potassium of 5.7 mg/dL. Arterial blood gas analysis was normal. Subsequently CSF analysis, blood and urine cultures were negative. Trans-cranial ultrasound ruled out any intra-cranial bleed. Baby was initially

managed with two normal saline boluses of 20 ml/kg each to correct the hydration status. Thereafter, half normal saline (N/2) was infused followed by N/3 normal saline with 5% dextrose to correct hypo-volemia and hyper-natremia. Prophylactic intravenous antibiotics (cefotaxime plus amikacin) were stopped after three days as the culture results were negative. Baby showed marked recovery over five days of hospitalization with normalization of renal parameters and serum sodium [Table 1].

Baby was started on breast feeds with intermittent formula feeds on 5th day and discharged on 10th day of admission. Due to lack of resources, breast milk sodium could not be estimated. At the time of discharge it was ensured that mother was aware of correct breast feeding practices and to monitor the weight gain of the infant. On subsequent follow up neonate had normal renal parameters and developmental milestones.

Discussion

Exclusive breast feeding is strongly recommended to reduce neonatal morbidity and mortality in developing countries like India, but clinicians do encounter neonates with hyper-natremic dehydration in their practice [3,4]. In elderly primigravida who are unaware of correct breastfeeding practices and reluctant to give formula feeds, the risk of developing hyper-natremic dehydration increases manifold [5]. In our case although mother was second gravida, she was very reluctant to give formula feeds to the

baby at home despite noticing inadequate breast milk production and poor weight gain of the baby, clearly emphasizing the lack of knowledge about adequacy of breast feeding. A normal term neonate usually loses about 7-10% of birth weight and regains birth weight by day ten of life. Any loss of weight more than 10% is a matter of concern. In our case baby lost about 30% of birth weight despite exclusive breastfeeding.

The etio-pathogenesis of hyper-natremic dehydration in neonates is not exactly clear but most accepted explanation is that because of poor breastfeeding practices, the baby gets less volume of milk resulting in dehydration. In our case despite exclusive breast feeding, baby developed hyper-natremia and dehydration. We could not measure the breast milk sodium levels because of lack of good lab support. As also noticed in our case, the clinical presentation of these babies is usually between first to third week of life with severe dehydration and lethargy [3,4]. Other differential diagnosis like sepsis, meningitis and intra-cranial pathologies should also be ruled out before making a diagnosis of hyper-natremic dehydration.

The management protocol in hyper-natremic dehydration is to correct hypovolemic shock initially with ringer lactate or normal saline boluses and then to gradually bring down serum sodium by 10-15 mEq/litre/day, as sudden decrease can result in neuronal damage [6]. We used half normal saline (N/2) initially followed by N/3 saline

Table 1: Table showing the laboratory parameters during hospitalization

Day	Hemoglobin (g/dL)	Total leucocyte count	Urea (mg/dL)	Creatinine (mg/dL)	Serum sodium (Na ⁺) mg/dL	Serum potassium (K ⁺) mg/dL	Serum calcium (Ca ²⁺) mg/dL
Day 1 (Admission)	15.3	10,200	200	2.8	178	5.7	9.8
Day 2	14.9	11,400	168	2.1	171	5.1	9.2
Day 3	14.2	10,600	104	1.7	167	4.3	8.9
Day 4	13.9	11,900	63	1.2	158	3.5	9.1
Day 5	14.3	9700	42	0.9	149	2.8	8.7
At Discharge	14.5	9500	37	0.5	137	3.3	8.9

in 5% dextrose as maintenance fluid. After initial fluid management babies can be restarted on breast feeds contrary to the belief that breast milk is contraindicated and formula feeds should be used [7]. We also tried to put baby on breast feeds but because of inadequacy of mother's milk formula feeds were given.

With a trend of early postpartum discharges, it is the duty of medical and paramedical staff to ensure that the mothers have been properly sensitized about adequacy of breast feeding and to monitor weight gain of neonates after discharge. Mothers, relatives and health care professionals must be explained that if a neonate has weight loss of more than 10% since birth and not gaining weight despite exclusive breast feeding, they should immediately report to the health care facility [8]. The patients who requires special attention are primigravida mothers with breast feeding difficulties (improper positioning or latching), breast engorgement, flat or inverted nipples.

Conclusion

Early post-partum follow up and lactation counseling in these mothers can be a useful tool to identify the neonates at high risk of developing this entity. There is an urgent need to foster a greater

awareness of this problem among lactating mothers and health care professional to prevent disastrous complications.

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