

# Breast feeding - when nature fails to satisfy

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## Summary

Human milk is the ideal source of nutrition for the healthy neonate. Milk from the mother whose diet is sufficient will supply the necessary nutrients. It is a considerable problem to discern if the milk supply is the adequate quantity for the infant. If the infant's water and caloric needs are not met for several days, signs and symptoms of hypernatremic dehydration >10% may develop. This report presents a case of a 15-day-old, breast-fed infant who developed significant hypernatremic dehydration.

**Key words:** Hypernatremic dehydration; Neonate; Breast-feeding

## Introduction

Reproduction is the biological fate of women that makes them participants in the miracle of creation. Breast feeding completes the reproductive cycle. Human milk is the ideal food for the newborn. It is ideally suited to the human species and contains all the necessary nutrients in ideal proportions for optimum development and growth. Breast feeding protects a baby against infections and allergies, and plays a major role in mother-infant bonding [1].

Exclusive feeding with breast milk up to the sixth month of life is usually adequate for the baby's development. Ninety-seven percent of mothers are capable of breast feeding their babies successfully. In some rare cases the quantity of milk is inadequate. A considerable problem that the physician faces is whether there is enough milk for the infant's needs. If the infant's needs are not met for several days, it presents signs and symptoms of hypernatremic dehydration, which can reach levels higher than 10%. A 15-day-old breast-fed neonate with severe hypernatremic dehydration is described [2].

## Case Report

A 15-day-old neonate, the first child of phenotypically healthy parents, was born full-term by vaginal delivery and his birth weight was 3,950 g. His obstetric and perinatal history was free of pathological findings. The mother and the neonate left the maternity clinic 72 hours after birth. The neonate was breast-fed every three hours and his parents described him as a "well-behaved and quiet baby". The reason for their visit to the pediatrician was jaundice. No fever, vomiting or diarrhea were reported, but he had produced no feces for five days. The local hospital that the baby was brought to by his parents, recognized that his general condition was very poor. Intravenous fluids were immediately administered and tracheal intubation and mechanical ventilation were performed. Then he was transferred to our hospital.

On admission, the neonate was critically ill. He was under mechanical ventilation and his skin was puckered and jaundiced. His mucous membranes were dry, his eyes were sunken and the conjunctivas were jaundiced. He had poor muscle tone, his neonatal reflexes were delayed and the anterior fontanel was inverted. His body weight was 3,220 g (730 g less than his birth weight). His temperature was 37.2° C, pulse 220/min and arterial pressure 73/40 mmHg. Examination of other systems revealed no pathological findings.

Laboratory tests on admission showed: pH 7.18, PO<sub>2</sub> 153 mmHg, PCO<sub>2</sub> 17.4 mmHg, HCO<sub>3</sub> 6.3 mmol/l, BE 19.8, oxygen saturation 99%, leukocytes 11,600/mm<sup>3</sup> (neutrophils 53%, lymphocytes 42%, monocytes 5%), hemoglobin 15.6 g/dl, hematocrit 44%, platelet count 405,000/mm<sup>3</sup>, reticulocyte count 0.5%, glucose-6-phosphate dehydrogenase in erythrocytes 219 nU/10<sup>9</sup> RBC. Total bilirubin was 20.3 mg/dl with direct bilirubin 1.1 mg/dl, direct Coomb's test negative. Urea nitrogen 63 mg/dl, creatinine 0.9 mg/dl, glucose 40 mg/dl, sodium 159 mmol/l, potassium 4.8 mmol/l, calcium 11.3 mg/dl. Tests of cerebrospinal fluid were normal and blood, cerebrospinal fluid and urine cultures were negative.

Parenteral fluid administration was started for his hypernatremic dehydration; (the level of which was estimated as greater than 15%). For metabolic acidosis correction bicarbonates were administered. A few hours after his admission the neonate showed improvement so the mechanical ventilation was discontinued. During the second day of hospitalization he was gradually able to be fed. He was hospitalized for seven days. During hospitalization his condition improved and he gained weight. The mother was encouraged to restart breast feeding supplemented with formula milk. The newborn was re-examined one month after being discharged. His general condition was excellent, no problems with feeding were reported and he had gained weight satisfactorily.

## Discussion

Human milk is a natural biological fluid. Its composition changes, depending on an infant's needs, from day to day, feeding to feeding and even during the course of feeding. It protects the infant against infections, like gastroenteritis, otitis media, bacterial meningitis, septicaemia, urinary tract infections, necrotizing enterocolitis

and respiratory tract infections. It encourages optimum physical, psychological and mental development. It creates powerful bonding between the infant and mother, and indeed the whole family. During breast-feeding oxytocin is released which helps the uterus to regain its initial shape and size and prevents unnecessary blood loss. It can help the mother to regain her pre-birth shape and physical condition. Mothers who breast feed have improved bone density, fewer fractures postmenopausally and lower incidence of breast and fallopian tube cancer. The superiority of human milk to formulas is indisputable. It contains all the necessary nutrients, enzymes, hormones and growth factors that the infant needs for proper development [1].

Human milk fulfills the nutritional needs of an infant for the first six months of life. The quality and quantity of milk produced is regulated by the endocrine system of the mother after delivery and by the quality and frequency of stimulation of the breast by the neonate. Ninety-seven percent of mothers are capable of breast feeding their infants successfully. Proper information, knowledge and education on the techniques of breast feeding play a primary role in encouraging mothers to breast-feed. Water is the largest proportionate ingredient of breast milk in sufficient quantity to cover the baby's needs even during summer months or fever. Additional water and liquid given to breast-fed infants replaces milk rich in nutritive ingredients and calories and it is unnecessary. If the needs of the infant for liquids and calories are not met for several days, it fails to gain weight and could also develop hypernatremic dehydration [3]. Mothers of these infants are usually prima-partum, of middle socioeconomic class and keen to breast-feed. Such newborns are usually between 1-3 weeks of age with no perinatal problems and are often described by the parents as "well-behaved and quiet babies". They breast feed slowly, not avidly, and do not follow a regular schedule of feeds. The appearance of a satisfied baby may lead to a delay in parent awareness of deterioration and request for medical attention, though clinical signs of dehydration and ill-health may already be apparent. The main cause of hypernatremic dehydration in these infants is inadequate intake of fluids and calories. Also, an insufficient milk production may be accompanied by a high sodium concentration which would contribute to a hyperosmolar condition in the infant as this milk contains less water than is usual in breast milk [4]. Most of these

babies present with renal failure in various degrees. In extremely rare cases, acute renal failure due to parenchymal damage or vessel thrombosis may occur [5]. When dehydration is severe (body weight less than 25% of initial birth weight), or accompanied by septicaemia, cardiovascular collapse can occur, even though vesicular volume is often normal. Neonatal hypernatremia is associated with severe effects to the central nervous system. Lethargy, irritability, loss of muscle tone and seizures all are frequent. Delayed effects may be psychomotor retardation, seizures or even death [6, 7]. Immediate fluid replacement should be administered according to the recognized therapeutic protocols of hypernatremic dehydration [5]. Since the most frequent cause of this condition is inadequate milk production rather than high sodium concentrations, it is of primary importance that the mother be encouraged to continue breast-feeding [8].

In conclusion, the importance of proper education, information and encouragement of the mother should be emphasized for successful breast-feeding. Also it is necessary to evaluate breast-fed infants' body weight at 10-14 days of age, so this rare, but severe condition, may be avoided.

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