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# Inadequate Breastfeeding may lead to Severe Hyponatremia: A Case Report

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## Abstract

**Background:** The benefits of breast feeding are well established worldwide. Inadequate breastfeeding may result in severe complications such as hyponatremic dehydration. This condition is rare and not well known. In this case report, we describe a case of severe hyponatremic dehydration revealed by fever with delayed consultation.

**Presentation of case:** We report the case of an exclusively breastfed male newborn. He was referred on the 13th day of life because of lethargy and fever. He had a severe dehydration on clinical examination. Serum sodium was of 172 mmol/L. The breast milk sodium was high as compared to a volunteer control (85 mmol/L vs 19 mmol/L). Breastfeeding was temporarily suspended and reintroduced after 5 days with favorable evolution.

**Conclusion:** Breast feeding associated hyponatremia can cause life-threatening complications in newborns. Prevention requires frequent and sufficient breastfeeding and weight gain monitoring during the first days of life.

**Keywords:** Breastfeeding; Dehydration; Hyponatremia

## Presentation of case

We report the case of a 13-day-old male neonate admitted to our Pediatric Department because of lethargy and fever. He was born at full term to a 28-year-old primiparous mother who had no pathological history and had no history of medication. The pregnancy proceeded normally without complications. He was born at 38 weeks of gestation with a birth weight of 3500 gm and an Apgar score of 8 at 1 minute, 9 at 5 minutes and 10 at 10 minutes. There was no context of neonatal infection. He was breastfed every 4 hours. His stool frequency was four bowel movements per day and he had no history of vomiting or regurgitation. At admission, his weight was of 3000 grams. The body temperature was of 38.3 degrees Celsius. The heart rate was of 120 beats per minute. He was lethargic and he had very sunken eyes. The skin pinch gone back very slowly, the anterior fontanel was slightly depressed and the tongue was very dry. Heel-stick glucose was of 0.8 g/L. There were no other abnormalities on the physical examination. The patient was immediately rehydrated intravenously with 5% glucose serum containing 2 ampoules of sodium chloride 10 mL (10%), 2 ampoules of potassium chloride 10 mL (7.4%) and one ampoule of calcium gluconate per 500 millilitres. Blood tests showed: urea: 18 mmol/L, sodium: 172 mmol/L, potassium: 4.2 mmol/L. Urine sodium was of 18 mmol/L. The Complete blood count was normal. C reactive protein was of 1 g/L. Serum procalcitonin was <0.05 ng/mL. Chest and abdominal X-rays were normal. Renal ultrasound showed two kidneys of normal size, regular contours and good differentiation with no dilation of the excretory cavities. The rehydration was slowed down and conducted over 48 hours regarding the situation of hyponatremia. The baby gradually increased his weight in 3 days with normalization of biological parameters. The transfontanelar ultrasound performed after 4 days of hospitalization was normal. This situation of hyponatremic dehydration had no obvious cause since the patient had no fluid loss. The urine density was of 1020 (normal=1005 to 1030) and serum Antidiuretic hormone (ADH) level was of 2.1 pg/mL (normal=1 to 5 pg/ml). We then discussed the hypothesis of high breast milk sodium level.

The breast milk sodium dosage was performed on the 13<sup>th</sup> day of life. The concentration was 85 mmol/L. It was of 19 mmol/L in the milk of a volunteer control assessed also on the 13<sup>th</sup> day post-partum, confirming the diagnosis of

## Introduction

Breastfeeding is universally recognized as the best and the safest way to feed neonates. However, it has been reported that some healthy breast fed newborns developed hyponatremic dehydration. This condition is rare and not well known especially in developing countries. Hyponatremia is a serious situation which may cause life threatening complications such as intracerebral edema, haemorrhage, and gangrene [1,2]. Mechanisms, risk factors and management of hyponatremia in breast fed newborns still controversial. This paper describes and discusses a case of hyponatremic dehydration in an exclusively breast fed neonate revealed by fever.

hypernatremia due to a high breast milk sodium level. The newborn was fed by a powdered infant formula for 5 days while the mother was extracting her breast milk. He was subsequently breast fed after a decrease of the breast milk sodium level to 21 mmol/L. He was discharged from the hospital after 6 days. Thereafter, he was doing well and his growth was normal without sequelae.

## Discussion

Hypernatraemic dehydration is a rare complication during breastfeeding. It is defined by a sodium level greater than 150 mmol/L [3]. The main symptom is weight loss that can range from 5 to 25% of birth weight associated or not with other clinical signs of dehydration [4-6]. In the presented case, the consultation was motivated mainly by fever and the mother did not pay attention to weight loss. Thereby, our patient had evident signs of dehydration and his serum sodium level was alarming testifying a delayed consultation. In fact, the situation may be more serious when hypernatraemia is manifested by only weight loss or a nonspecific symptom such as fever [7]. In these cases, there is also a risk of diagnostic delay even if the consultation is early especially when the clinician is not aware of this entity. The pathophysiology of hypernatraemic dehydration clearly identified. However, it seems that it may result from inadequate intakes of breast milk by lack of experience of primiparous mothers [8,9]. The sodium concentration of breast milk is high at birth and decreases progressively over the subsequent days [10]. Indeed, efficient sucking is a key mechanism that allows the transformation of colostrum into transitional milk and subsequently into mature milk containing less sodium. Galipeau et al. had demonstrated that also breastfeeding frequency during the first days of life influences breast milk sodium concentration and that breastfeeding every 2 to 3 hours is suitable for a safe decrease in sodium concentration [9]. Other risk factors for hypernatraemia such as gestational diabetes and maternal medication have been reported in the literature [9,11]. For our patient, the mother was primiparous and probably not paying attention to feeding frequency and duration. For management, breastfeeding should be resumed within few days. The severity of the disease should not discourage breastfeeding, which is the most appropriate for the neonate and mother health. This case highlights the importance of recognizing the risk of hypernatremia in breastfed newborns. It is a condition that can be serious and should be prevented by early and adequate breastfeeding and should never discourage it.

## Conclusion

Hypernatraemic dehydration remains rare when breastfeeding is well adapted to the needs of the newborn. It

should be prevented by precocious breastfeeding within the first hour after birth. Mothers, especially primiparas, should be aware about the necessity of frequent breastfeeding and checking the volume of breast milk and the weight gain of the baby. In the situation of dehydration, breastfeeding maternal should never be stopped definitively but temporarily replaced until it acquires its final composition.

## Conflicts of Interest

No conflict of interest.

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