Subclinical Venous Sinus Thrombosis Secondary to Hypernatraemic Dehydration

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Citation

Abstract
An 8-day-old infant was admitted to a paediatric intensive care unit with severe hypernatraemic dehydration. An MRI brain was performed which revealed extensive venous sinus thromboses. This is a recognised but rare complication of hypernatraemic dehydration and the importance of early detection and intervention of this condition is again highlighted. This is the first case report of venous sinus thrombosis secondary to hypernatraemic dehydration in a patient with no clinical neurological signs. We postulate that there may be a cohort of infants with subclinical cerebral venous thrombosis secondary to hypernatraemic dehydration.

CASE REPORT
An eight day old male infant presented to the Accident and Emergency department at St George’s Hospital, Tooting, with a history of poor feeding. He was reported to have been ‘floppy’ that morning. He was born at term weighing 3kg and was discharged home on day 2 of life. A detailed history revealed that the infant’s mother had been struggling to establish breast feeding. Postnatal assessments by the community midwife had been missed on 2 consecutive days.

On examination the patient had signs consistent with severe dehydration. He was floppy and lethargic with a sunken fontanelle, decreased skin turgor, dry mucous membranes and capillary refill time of greater than 5 seconds. He had lost 23% of his birth weight. He was breathing spontaneously but had periodic, spontaneously resolving apnoeic episodes. Access was established by siting an intrasosseous needle and two 20mls/kg fluid boluses were administered. The patient became more responsive but continued to have apnoeas. He was intubated and transferred to Paediatric intensive care (PICU). His biochemistry confirmed hypernatraemic dehydration with an initial serum sodium of 165mmol/l and urea of 25mmol/l. The patient received another 40ml/kg of fluid to restore perfusion, and was then started on an enteral rehydration regime (as per our paediatric department protocol) to slowly correct the serum sodium over the subsequent 48 hours. His presenting platelet count was 91.

After biochemical parameters had been slowly corrected, the patient was extubated uneventfully on day 3 of admission and showed no signs of neurological sequelae. There were no signs of any end-organ damage. However, it was noted that the platelet count had decreased further to 72 on day 3. This raised the concern of an underlying thrombosis and an MRI of the brain was arranged urgently.

Figure 1
Figure 1. MRI demonstrating saggital (arrow) and long sinus thrombosis
some improvement but persistent thrombosis. There were no
signs of thrombosis in any other sites.

After discharge from PICU, the paediatric neurology team
anticoagulated the patient, starting on subcutaneous heparin
at an initial dose of 75IU/kg twice daily, which was
subsequently increased to 150IU/kg. After the patient had
established adequate breastfeeding and the parents had been
educated in administration of subcutaneous heparin
injections, the patient was discharged with regular follow up
and outpatient monitoring of Factor Xa levels arranged. To
date there have been no seizures or evidence of neurological
fallout.

There were no other risk factors for this condition and full
coagulopathy and thrombophilia screen have shown no
abnormalities, therefore it is considered that this thrombotic
event was directly attributable to the hypernatraemic
dehydration.

DISCUSSION

In a review of the literature there are several reported cases
of venous sinus thrombosis associated with hypernatraemic
dehydration. Karadag et al reported a case of sagittal sinus
thrombosis as a complication of hypernatraemic dehydration
in a 3 day-old girl. ¹ Subsequently Fawke et al reported 3
cases of infants with cranial venous thrombosis secondary to
hypernatraemic dehydration. ² Prior to this we could find
only one other report of cranial sinus thrombosis directly
related to hypernatraemic dehydration. ³ Our patient differs
from the reported cases in that it is the only case that did not
develop seizures or have any clinical neurological signs. Our
only reason to suspect the diagnosis was the presence of a
low platelet count in the presence of severe hypernatraemic
dehydration.

Hypernatraemic dehydration as a complication of
breastfeeding is showing an increasing incidence ⁴. This case
highlights a severe complication of hypernatraemic
dehydration. Whilst “breastfeeding is best”, hypernatraemic
dehydration as a result of inadequate breast feeding may go
undetected until the infant becomes symptomatic.

Inexperienced parents may be unaware of or misinterpret the
worrying signs of dehydration. Professional surveillance
including the weighing of a newborn infant and appropriate
intervention in the first few days of life is essential in
preventing hypernatraemic dehydration. The importance of
this has been previously highlighted ⁵, and as pointed out in
Karadag et al’s letter, the American Academy of Pediatrics
has recommended that all breastfeeding newborns should be
evaluated and weighed by a paediatrician or other
knowledgeable health care professional within three to five
days of age ¹ ⁵.

CONCLUSIONS

This case highlights the need for high clinical suspicion of
cerebral venous thrombosis in infants with severe
hypernatraemic dehydration, even in the absence of
neurological symptoms or signs. We postulate that there may
be a cohort of asymptomatic infants with undiagnosed
cerebral venous thrombosis secondary to hypernatraemic
dehydration. Whether such a diagnosis has long term
implications or even requires treatment remains to be
established.

We suggest that neonates presenting with severe
hypernatraemic dehydration should have brain imaging;
further studies in evaluating the threshold for imaging are
needed. Longitudinal neurodevelopmental follow up of
babies with hypernatraemic dehydration is required to gain
further insight into the effects of subclinical venous sinus
thrombosis in later life.

References

1. Karadag, Uras, Odemis, Tunc, Tatli: Superior sagittal
sinus thrombosis: a rare but serious complication of
hypernatraemic dehydration in newborns. J.Perinat. Med
2007; 35: 82-83
2. Fawke J, Whitehouse W: Monitoring of newborn weight,
breast feeding and severe neurological sequelae secondary to
dehydration. Arch Dis Child 2007; eletter September issue
3. Hilliard T, Marsh M, Malcolm P, Murdoch I, Wood B:
Radiological Case of the Month. Arch Pediatr Adolesc Med
1998; 152: 1147-1148
breast fed babies? Arch Dis Child Fetal Neonatal Ed 2001;
85: F145
5. Gartner LM, Morton J, Lawrence RA, Naylor AJ, O’Hare
D, Schanler RJ, Eidelman A: Breastfeeding and the use of
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