Hyponatremia in Labour and the Postpartum Period

1. Hypervolemic Hyponatremia as a Reversible Cause of Cardiopulmonary Arrest in a Postpartum Patient with Preeclampsia.

**Author(s):** Hsu, Richard; Tong, Anna; Hsu, Chaur-Dong

**Source:** Case reports in obstetrics and gynecology; 2021; vol. 2021; p. 8850725

**Publication Date:** 2021

**Publication Type(s):** Case Reports

**PubMedID:** 33628547

Available at [Case reports in obstetrics and gynecology](#) - from Europe PubMed Central - Open Access

Available at [Case reports in obstetrics and gynecology](#) - from Unpaywall

**Abstract:** Although the incidence of preeclampsia complicated by hyponatremia is reportedly rare, the effects on the maternal outcome are severe and life-threatening. Here, we describe a case of a patient with preeclampsia who coded postpartum and was discovered to have hypervolemic hyponatremia and subsequently recovered after fluid diuresis and resolution of hyponatremia. While hyponatremia in preeclampsia is rare, it is even more unique for it to lead to cardiopulmonary arrest consequently. Therefore, sodium levels and fluid status should be monitored closely and promptly corrected without delay to prevent cardiopulmonary arrest in patients with preeclampsia.

**Database:** Medline
2. Acute Hyponatremia After a Religious Fast.

Author(s): Rosen, Raphael J; Bomback, Andrew S

Source: AACE clinical case reports; 2021; vol. 7 (no. 4); p. 236-238

Publication Date: 2021

Publication Type(s): Case Reports

PubMedID: 34307843

Available at AACE clinical case reports - from Unpaywall

Abstract:ObjectiveOur objective is to describe how polydipsia and intake of nonsteroidal anti-inflammatory drugs (NSAIDs) after fasting while breastfeeding may result in acute symptomatic hyponatremia. Case ReportWe present the case of a 24-year-old woman at 4 weeks postpartum who engaged in a 20-hour fast from both eating and drinking, during which she continued to breastfeed her newborn child. After ending her fast, she noted decreased milk supply. Attributing her decreased milk supply to dehydration, she then consumed 4 L of water with little salt and also took NSAIDs for a headache, which continued to worsen. Upon presentation to the emergency department, she was found to have a sodium level of 124 mEq/L (normal, 135-145 mEq/L) and a urine specific gravity of 1.015 (normal, 1.005 - 1.030). Thyroid function and cortisol level test results were normal. She was diagnosed with acute symptomatic hypovolemic hyponatremia. After 1 L of normal saline her sodium rapidly corrected to normal and her symptoms resolved. At 2 months of follow-up she was asymptomatic and had no further episodes of hyponatremia. DiscussionDue to the patient’s gender and small body size, 4 L of water was sufficient to lower her serum sodium rapidly from normal to 124 mEq/L. She was unable to excrete this water due to a combination of hypovolemia-mediated arginine vasopressin and NSAID use. ConclusionClinicians should be cognizant that reproductive-age women are uniquely susceptible to hyponatremia and dangerous sequelae therein. They should counsel fasting individuals, particularly lactating women, to consume solute as well as fluid after fasting.

Database: Medline
3. Acute severe symptomatic hyponatremia in the post-partum period: The syndrome of oxytocin-induced anti-diuresis (SOIAD)

Author(s): Shahzad M.A.; Whittier W.L.; Rodby R.A.

Source: Journal of the American Society of Nephrology; 2021; vol. 32; p. 376

Publication Date: 2021

Publication Type(s): Conference Abstract

Abstract: Introduction: Oxytocin (OXT) is a neuropeptide used in pregnancy to induce uterine contraction. It is structurally related to vasopressin (AVP) by a difference of only 2 amino acids. While it does not have antidiuretic activity at physiologic levels, it can when administered at pharmacologic doses (>20 mU/min). We present a case of severe symptomatic hyponatremia after receiving oxytocin in the post-partum period. Case Description: A 31 y/o G1PO woman was admitted with premature membrane rupture at week 38. An IV oxytocin infusion (2mU/min) was started to augment labor. Her serum sNa 6 hrs later was 132 mmol/l (baseline sNa 140). Her delivery was c/b uterine atony and postpartum hemorrhage requiring a bolus of IV oxytocin (10 U over 30 min) followed by infusion at 8 mU/min. The sNa 18 hr later was 118 mmol/l. She reported nausea. Her sOsm was 252 mOsm/kg with UNa of 95 mmol/l and Uosm 880 mOsm/kg consistent with the syndrome of anti-diuresis (SIAD). OXT was suspected and was stopped. 2 hr later, a rapid water diuresis ensued (u vol 150-200 cc/hr, with uOsm 92 mOsm/kg). The sNa 4 and 8 hrs later increased to 124 and 127 respectively. Because of concern for over-correction, she was given DDAVP and D5W. This resulted in a gradual (6-8 mmol/l/24 hr) sNa increase to 140 mmol/l over the next 48 hr (Fig 1).

Discussion(s): Therapeutic OXT can result in anti-diuresis with water retention. OXT half-life is only 1-6 min and is further reduced during pregnancy. Women are more likely to have severe neurologic sequelae of hyponatremia so it is fortuitous that the half-life of OXT is so short, and discontinuation alone should result in a rapid water diuresis. Still, although acute hyponatremia can usually be safely corrected rapidly, concern over what could have been an increase in sNa of 28 mmol/l over several hrs necessitated a DDAVP clamp to slow correction. She had a complete recovery. SOIAD can be a severe complication of OXT. Since it can occur rapidly and severely, sNa should be followed closely when patients are on OXT infusion.

Database: EMBASE

4. Peripartum hyponatremia; case reviews and vigilance in management

Author(s): Saeed B.Z.; Iram N.; Selby K.; Zill-E-Huma R.

Source: Revista Argentina de Endocrinologia y Metabolismo; 2021; vol. 58; p. 189

Publication Date: 2021

Publication Type(s): Conference Abstract

Abstract: Introduction: Peripartum hyponatremia is a common electrolyte disorder which may result in severe maternal and neonatal sequelae. We present three cases of peripartum hyponatremia with hypervolemic hyponatremia and water overload as a risk factor. All cases reverted to normal serum Na+ levels post-delivery. Case Description: Case 1: 33 years old primigravida, went into spontaneous labour at home at 40 weeks of gestation. She required transfer to hospital because of exhaustion and slow progress in labour and had normal vaginal delivery. Her bloods revealed serum Na+ of 116mmol/L. Baby was born in good condition with cord blood Na+level of 111mmol/L. Following a multi-disciplinary review, fluid restriction to 1.5L/day instituted. Retrospective enquiry revealed 8L fluid intake at home. Case 2: 32 years old primigravida, presented in spontaneous labour at 40+2 weeks gestation. Initial blood results showed serum Na+ of 132mmol/L. She had poor urine output with positive balance of 2,625mls hence had repeat bloods with serum Na+ of 126mmol/L. Fluid restriction was commenced at 80ml/hr. She had forceps delivery with neonatal cord Na+ of
125mmol/L. Case 3: 39 years old primigravida with past history of nephrotic syndrome, normal renal function and blood pressure in pregnancy underwent induction of labour at 41 weeks of gestation. During labour, her serum Na+ was 126mmol/L with normal creatinine at a positive balance of 999mls. Fluid restriction to 80ml/hr was commenced. Due to further drop in her Na+ level to 124mmol/L and symptomatic with twitching of head and neck, medical and anaesthetic team were involved and further fluid restriction commenced to 30ml/hr. Clinical discussion: Peripartum hyponatremia is mostly dilutional or hypotonic. Pregnant women are more at risk because of physiological changes in pregnancy. Oxytocin has a similar chemical structure to ADH and increases the risk of fluid retention. Incidence increases with increased fluid intake, 1% in 1L versus 26% with >2.5L in labour. Early symptoms are non-specific and may be attributed to pregnancy and labour. It leads to risk of neonatal hyponatremia because of fluid and electrolyte equilibrium across placenta. A strict fluid balance should be maintained during induction and in established labour. All maternity units should create a local guidance apart from a need of a national guideline to increase awareness of fluid management in labour and peripartum hyponatremia to avoid serious complication for women and neonates.

Database: EMBASE

5. How low is too low? determining the incidence of symptomatic neonatal hyponatraemia secondary to maternal peripartum hyponatraemia-an unsolved problem

Author(s): Kirk N.; Mcbay-Doherty R.; McGinn C.; Verner A.

Source: Archives of Disease in Childhood; Oct 2021; vol. 106

Publication Date: Oct 2021

Publication Type(s): Conference Abstract

Abstract: Background In Northern Ireland the Guidelines and Audit implementation network produced guidance in 2017 advising that paediatricians should be informed when infants are born to mothers with a peripartum serum sodium <129mmol/L. However, there is no current guidance on management of these infants. Regional practice is variable with infant sodium checked between 12-24 hours old, or not at all. A literature review found 9 case reports of neonatal seizures secondary to isolated maternal hyponatraemia. All occurred within 6 hours of delivery, with maternal sodium range 107-124mmol/L, and neonatal sodium range 108-126mmol/L. Objectives Firstly, to ascertain the incidence of neonatal hyponatremia secondary to maternal peripartum hyponatremia through a regional audit. Secondly to determine the incidence of neonatal seizures secondary to hyponatremia and thereby gain insight into the serum sodium, (both maternal and neonatal,) that requires observation and/or intervention in order to reduce NICU admissions and adverse outcomes for infants. Methods In two neonatal units we used retrospective case analysis to review the data of infants >35 weeks’ gestation born to mothers with Sodium <129mmol/L (18hrs pre delivery, until 8hrs post-partum.) From March 2018- March 2020 96 cases were identified in the tertiary neonatal unit and from May 2020-November 2020 10 cases were identified in a district general unit. Data was collected for each infant including symptoms of hyponatraemia, clinical features, investigations, results and management. Results A total of 106 cases of maternal peripartum hyponatremia <129mmol/L were identified. In 45 of these cases, infant serum sodium was checked. 10 had serum sodium <129mmol. 11 infants were treated for hyponatremia; 10 (Na 123-131mmol/L) received oral supplementation and 4 (Na 123-129mmol/L) were admitted to NICU and received intravenous fluids. 2 of these cases presented clinically (prior to blood sampling) with hyponatraemic seizures with no other cause identified. Both were <8hrs of life with maternal sodium of 123mmol/L and 127mmol/L. Standard investigations (including lumbar puncture and MRI brain) to consider other causes for symptoms, were performed and seizures treated with anticonvulsants; both infants
Neonatal hyponatraemia secondary to maternal hyponatraemia does occur and can cause neonatal seizures. However, these events are rare, occur early (<12 hours) and are associated with a very low maternal sodium. These infants would not be identified by current practice of testing at 12-24 hours of life. We have used our data as part of a quality improvement project to develop a guideline identifying infants at risk of symptomatic hyponatraemia whilst reducing unnecessary investigations in asymptomatic, low risk infants of mother’s with mild hyponatraemia. This guideline is currently being trialled with plans to review and implement regionally.

**Database:** EMBASE

---

**6. Pregnancy outcomes in women with hyponatraemia and preeclampsia: Case series and literature review.**

**Author(s):** Morton, Adam; Lumchee, Matthew; Kumar, Sailesh; Jarvis, Elizabeth

**Source:** Pregnancy hypertension; Sep 2021; vol. 26; p. 38-41

**Publication Date:** Sep 2021

**Publication Type(s):** Journal Article

**PubMedID:** 34496324

**Abstract:**

**OBJECTIVES**

To determine the prevalence, clinical course, complications and management of preeclampsia complicated by hyponatraemia.

**STUDY DESIGN**

A ten year retrospective audit of women delivering at a tertiary referral hospital with preeclampsia complicated by hyponatraemia (defined as serum sodium < 130 mmol/L).

**MAIN OUTCOME MEASURES**

The prevalence, time to delivery, complications, treatment and time to recovery of hyponatraemia in women with preeclampsia associated with hyponatraemia.

**RESULTS**

There were 129 cases of preeclampsia associated with hyponatraemia, representing 9% of women with preeclampsia, and 0.27% of deliveries overall. Hyponatraemia was associated with a significant rate of complications of preeclampsia; acute kidney injury in 34.1%, HELLP syndrome in 17.1%, fetal growth restriction in 36.4%, stillbirth in 2.3%, the use of magnesium sulphate in 44.2%, and postpartum maternal admission to an intensive care unit in 28.7%. Moderate/severe hyponatraemia was associated with greater risk of acute kidney injury, fetal growth restriction and post-partum maternal admission to an intensive care unit than mild hyponatraemia. Urgent delivery was required in 71% of women for either obstetric or fetal indications within 24 h of diagnosis of moderate/severe hyponatraemia. In almost all cases, hyponatraemia rapidly resolved postpartum without requirement for fluid restriction or intravenous saline.

**CONCLUSIONS**

Hyponatraemia should be regarded as a marker of severity in the setting of preeclampsia, and in the absence of an alternative cause may be an indication for expedited delivery. Hyponatraemia typically recovers rapidly following delivery without the need for specific therapy.

**Database:** Medline
7. Management of hyponatraemia in pre-eclampsia with severe features.

**Author(s):** Whitley, Julia; Swartz, Sarah; Martinez, Anjali

**Source:** BMJ case reports; Aug 2021; vol. 14 (no. 8)

**Publication Date:** Aug 2021

**Publication Type(s):** Case Reports Journal Article

**PubMedID:** 34404669

Available at BMJ case reports - from HighWire

Available at BMJ case reports - from ProQuest (Health Research Premium) - NHS Version

**Abstract:** Pre-eclampsia is a common pregnancy complication with many associated maternal and fetal risks, yet its pathophysiology remains poorly understood. Hyponatraemia is a rarely described finding in pre-eclampsia that has been associated with both maternal and fetal complications and medically indicated delivery. We present a case of hyponatraemia in a patient admitted for induction of labour for gestational hypertension, which developed into pre-eclampsia with severe features requiring magnesium sulfate therapy for seizure prophylaxis. The patient’s hyponatraemia resolved with delivery, fluid restriction and serial sodium monitoring. Adjustment to the components of the patient’s magnesium sulfate infusion was made to reduce free water intake and avoid further exacerbation of her hyponatraemia. While there is currently no recommendation to routinely monitor sodium levels in hypertensive disorders of pregnancy, careful consideration of this potential finding in cases of pre-eclampsia should be given due to the overlap between symptoms of hyponatraemia and cerebral symptoms of pre-eclampsia.

**Database:** Medline

---

8. Overconsumption of fluids during labour leading to water intoxication and a tonic-clonic seizure in a healthy labourer.

**Author(s):** Shanmugharaj, Yogita; Schut, Viktorie; Syed, Rifat; Zakaryan, Anahit

**Source:** BMJ case reports; Jun 2021; vol. 14 (no. 6)

**Publication Date:** Jun 2021

**Publication Type(s):** Case Reports Journal Article

**PubMedID:** 34162617

Available at BMJ case reports - from HighWire

Available at BMJ case reports - from ProQuest (Health Research Premium) - NHS Version

**Abstract:** A 33-year-old woman in her first pregnancy with no significant medical history had a tonic-clonic seizure one hour after delivery due to acute hyponatraemia caused by excess intake of fluids. She was admitted to a birthing centre as a low-risk labourer where she spent 19 hours including 4 hours in the second stage of labour. Throughout the labour, she was encouraged to drink as per her own initiative and thirst. However, there was no monitoring of fluid intake. In spite of initial confusion about the cause of the seizure, a multidisciplinary approach helped with diagnosis of an underlying pathology and allowed timely treatment to avoid adverse outcomes in this patient. We would like to increase awareness of a possibility, however rare, of water intoxication due to fluid overconsumption by patients in labour and encourage production of information guidance for monitoring of fluid intake of women in labour.

**Database:** Medline
9. P.100 Association between umbilical cord, maternal and neonatal sodium concentration using cord gas point-of-care analysis to expedite a diagnosis of peripartum hyponatraemia

Author(s): Carlson-Hedges L.; Pillai A.
Source: International Journal of Obstetric Anesthesia; Jun 2021; vol. 46
Publication Date: Jun 2021
Publication Type(s): Conference Abstract

Abstract: Introduction: Intrapartum hyponatraemia is potentially life threatening yet often non-specific symptoms can result in delayed diagnosis. Umbilical artery and venous serum sodium are correlated to maternal plasma sodium. Guidelines neglect to use cord blood for diagnosis of maternal hyponatraemia. We assessed links between umbilical artery sodium and maternal and neonatal sodium in symptomatic and asymptomatic severe maternal hyponatraemia. Method(s): During 2017-2019 we reviewed the cases of all severe intrapartum hyponatraemia within our hospital. Severe hyponatraemia was defined as serum sodium \[\text{Na}^+\] < 25 mmol/L. Result(s): 10 cases were identified. Six cases were symptomatic with a mean maternal serum sodium of 116.5 mmol/L [110-120 mmol/L]. Three of these cases had cord gas samples and five had neonatal serum sodium levels taken. Comparison between maternal serum and cord gas sodium levels showed a maximum difference of 3 mmol/L. All neonatal serum sodium levels showed hyponatraemia with a mean time of testing 11.9 h post-delivery [7.5-15.5 h]. Four cases were identified as asymptomatic severe maternal hyponatraemia with cord blood gas sampling at delivery and mean maternal sodium of 121.8 mmol/L [116-124 mmol/L]. Comparison of these results with umbilical cord gas sodium concentrations showed a maximum 2 mmol/L difference. The mean time for maternal serum sodium concentration sampling was 4.8 h post-delivery [0.95-7.77 h].

Discussion: These cases show that in women who are asymptomatic or exhibit non-specific symptoms in labour, rapid point-of-care measurement of cord sodium at delivery could expedite further investigations of both the mother and neonate to reduce delay in diagnosis and management of hyponatraemia. Copyright © 2021

Database: EMBASE
10. Severe hyponatremia in labor

Author(s): Abdulkadir L.; Thangavelu M.


Publication Date: Jun 2021

Publication Type(s): Conference Abstract

Available at BJOG: An International Journal of Obstetrics & Gynaecology - from Wiley Online Library Science, Technology and Medicine Collection 2019

Available at BJOG: An International Journal of Obstetrics & Gynaecology - from Unpaywall

Abstract: Objective The objective of this case is to highlight the importance of severe hyponatremia in labor. Case report 31-year-old G1P0 consultant-led care due to BMI of 15.7, no medical conditions, uneventful pregnancy, normal fetal growth, propos induced for postdates at 42 weeks. Admission had a slight rise in blood pressure confirming pregnancy-induced hypertension blood screening and a normal urine sample. The patient went on to develop frequent contractions with a normal cardiotocography. Sodium levels showed severe hyponatremia of 118 but asymptomatic, serum osmolality was low at 246 mosmol/kg and urine osmolality levels were normal. No clinical signs of adrenal insufficiency and shortly afterward had a normal delivery of a healthy live female. After delivery, she developed an anoxic postpartum hemorrhage of 1800 ml for which she received uterotonics including IV syntocinon infusion, 2 L of Normal saline, and Bakri balloon. Repeat sodium levels at PPH 109. She was cold, clammy, and unresponsive during the PPH. Remained hyponatremic day 1 postnatal. Was reviewed by the medics who discovered she usually drinks 5 L of water daily and remained asymptomatic with an impression of euvolemic hyponatremia likely due to psychogenic polydipsia and planned for fluid restriction. She made a good recovery and sodium levels normalized to 132 mmol/L two days postnatal. The baby didn’t have any complications of severe hyponatremia. Discussion Maternal hyponatremia in labor is often undiagnosed and can have significant maternal and neonatal complications. Serum sodium levels are often slightly low in pregnancy due to the dilutional effect of water retention and this can be exaggerated in labor with oxytocin effect. Often water is given orally in labor instead of isotonic drink which can lead to severe hyponatremia. Hyponatremia can cause varying degrees of symptoms from headache, lethargy, confusion, and coma. Neonatal hyponatremia can cause neonatal seizures. Although it is important women should be well hydrated in labor, women shouldn’t be encouraged to drink excessively in labor. An isotonic non-fizzy sports drink should be encouraged. Background sodium levels should be checked when oxytocin is commenced as this can cause hyponatremia. Fluid management is crucial and administration of oral and intravenous fluids should be strictly recorded and if on a positive balance of more than 1.5 L, serum sodium levels checked in labor. Conclusion Increased water intake has led this patient to overwhelm the kidneys’ ability to excrete water. Hyponatremia isn’t uncommon in labor and up to 48 h postnatally.

Database: EMBASE
11. Impact of a quality improvement project to improve the fluid management in labour and reduce the incidence of peripartum hyponatraemia

Author(s): Saeed B.Z.; Iram N.; Babychan P.; Pack F.; Selby K.; Zill-E-Huma R.

Source: BJOG: An International Journal of Obstetrics and Gynaecology; May 2021; vol. 128 ; p. 71

Publication Date: May 2021

Available at BJOG: An International Journal of Obstetrics & Gynaecology - from Wiley Online Library Science, Technology and Medicine Collection 2019

Available at BJOG: An International Journal of Obstetrics & Gynaecology - from Unpaywall

Abstract: Introduction Peripartum hyponatraemia is mostly dilutional or hypotonic. Maternal hyponatraemia leads to neonatal hyponatraemia. Incidence of peripartum hyponatraemia is still unknown. Pregnant women are more at risk because of physiological changes in pregnancy. Oxytocin has a similar chemical structure to ADH and increases the risk of fluid retention. Objective Aim was to assess current practice, perform a PDSA and check compliance with the departmental guideline on fluid management and peripartum hyponatraemia. Methods Retrospective review of 30 set of notes from February to June 2020. Results Women were 19-39 years old with the BMI of 18-40. 67% were primigravida. Majority of the women had no risk factors while 3% had pre-existing renal disease and 10% were diagnosed with pre-eclampsia. Only 23% had appropriate fluid balance documentation in labour. 60% required initiation of peripartum sodium pathway but 11% had documented obstetric review. Level of serum Na+ ranged between 124-144 mmol/L. 80% of cases with serum Na+ <130 mmol/L had positive fluid balance of >1500 ml and among them 40% of women were symptomatic of hyponatraemia at levels <125 mmol/L, therefore required MDT input. One patient required ITU admission. Conclusion Strict fluid management in labour is paramount to early recognition and management. Timely diagnosis and management of peripartum hyponatraemia is important to avoid potential complications to mothers and neonates. We introduced teaching and training through PROMPT, awareness week, newsletters, safety huddles and introduction of new fluid balance charts. We aim to reevaluate our services and complete PDSA cycle which should help in further improvement in patient care.

Database: EMBASE
12. Severe hyponatremia in preeclampsia: a case report and review of the literature

**Author(s):** Pu Y.; Wang X.; Bu H.; Zhang W.; Lu R.; Zhang S.

**Source:** Archives of Gynecology and Obstetrics; Apr 2021; vol. 303 (no. 4); p. 925-931

**Publication Date:** Apr 2021

**Publication Type(s):** Article

**PubMedID:** 33033866

Available at [Archives of gynecology and obstetrics](https://link.springer.com/article/10.1007%2Fs00404-021-05540-7) - from SpringerLink - Medicine

**Abstract:** Purpose: To summarize the clinical characteristics and treatments of preeclampsia complicated with hyponatremia. Method(s): We reported a new case of preeclampsia complicated with severe hyponatremia; searched for relevant articles from the PubMed, Scopus and Cochrane databases; and reviewed all reported cases. Result(s): Twenty-one reported cases were found. Our case is 22nd, and the serum sodium level in this case was the lowest reported. After treatment comprising fluid restriction, hypertonic saline and caesarean section, a relatively good outcome was achieved. In all reported cases, SIADH, preeclampsia or the combined effect of preeclampsia and induced nephrotic syndrome were the speculated pathogeny. Termination was performed due to adverse manifestations; six cases underwent transvaginal deliveries, and sixteen cases underwent caesarean section. Fifteen patients recovered from hyponatremia within 72 h after delivery. Conclusion(s): The pathogenesis of hyponatremia occurring in patients with preeclampsia is still unclear. Termination of the pregnancy led to a stabilization of the sodium level, ICU monitoring was necessary, and fluid restriction and hypertonic saline intake were applied; however, there was no evidence of the effectiveness of the treatments. Copyright © 2020, Springer-Verlag GmbH Germany, part of Springer Nature.

**Database:** EMBASE
Hyponatremia during peripartum period is a recognized but underreported complication. Hyponatremia has significant adverse effects on mother as well as infant. Hyponatremia can be dilutional or nondilutional. Dilutional or hypervolemic hyponatremia is more common during the labor and postpartum period. The blood sodium concentration during pregnancy is lower, 130-140 mmol/L, which is being considered normal compared to 135-145 mmol/L in nonpregnant women. Thus, when the blood sodium level is below 130 mmol/L, we should consider it as hyponatremia of pregnancy. Oxytocin can play a major role to cause dilutional hyponatremia if large volumes of hypotonic fluids are consumed or infused intravenously simultaneously. Hyponatremia during labor is such a complex problem that it can be the result of several factors. In hyponatremia, there is progressive dysfunction of the neurological system, which in association with cerebral edema results in various symptoms. Symptoms may vary from headache, nausea, vomiting, lethargy, muscle cramps, and disorientation, progressing to seizures, coma, respiratory arrest, and death. A proper clinical history and various blood tests including serum sodium are important to diagnose the severity of hyponatremia. Women in labor should be advised to drink water only up to their thirst impulse; excessive fluid intake should be avoided. The treatment depends on cause, severity, and duration of hyponatremia, as well as clinical status of patient, and associated comorbidities. Once acute water intoxication and hyponatremia have been diagnosed, it is necessary to correct the hyponatremia by water restriction and to watch sodium concentration in the blood. Severe hyponatremia (sodium <125 mmol/L + symptoms) is a medical emergency. The primary idea of treatment should be to improve symptoms instead to normalize the blood sodium level.

**Author(s):** Briggs, Emily; Greer, Orene; Shah, Nishel Mohan; Singh, Natasha

**Source:** BMJ case reports; Sep 2020; vol. 13 (no. 9)

**Publication Date:** Sep 2020

**Publication Type(s):** Case Reports Journal Article

**PubMedID:** 32878836

Available at [BMJ case reports](https://www.bmjcasereports.com/content/13/9/2018) - from HighWire

Available at [BMJ case reports](https://www.proquest.com/ehub/content/community/32878836) - from ProQuest (Health Research Premium) - NHS Version

Available at [BMJ case reports](https://www.unpaywall.org) - from Unpaywall

**Abstract:** We report a case of profound, symptomatic hyponatraemia in association with pre-eclamptic toxaemia (PET) in a 38-year-old nulliparous woman with type 1 diabetes mellitus. This patient developed hypertension and proteinuria at 31+6 weeks' gestation and was admitted for management of pre-eclampsia. Severe headache, visual disturbance and nausea were associated with a hyponatraemia of 115 mmol/L followed by ketoacidosis. This was reversed through fluid restriction, supplementation with 1.8%-3.0% hypertonic saline and a volume-reduced variable-rate insulin infusion. Clinical stability was achieved and she was subsequently worked up for an induction of labour for worsening pre-eclampsia. Hyponatraemia in the context of PET has been previously reported as rare. However, it has complications that may significantly compound the sequelae of severe PET. We propose that specific and focused monitoring of serum sodium levels should become common practice in the management of women with this condition to allow for timely, measured correction of abnormalities.

**Database:** Medline
15. Preeclampsia and low sodium (PALS): A case and systematic review

Author(s): Powel J.E.; Rosenthal E.; Roman A.; Berghella V.; Chasen S.T.


Publication Date: Jun 2020
Publication Type(s): Review
PubMedID: 32344245

Abstract: Normal physiologic changes in pregnancy include mild hyponatremia. In some cases of preeclampsia, more significant hyponatremia has been associated with syndrome of inappropriate antidiuretic hormone secretion and hypervolemic hyponatremia. A 45-year-old gravida 2, para 0010 with a dichorionic twin gestation was diagnosed with preeclampsia at 30 weeks 6 days and noted to have concomitant hyponatremia of 125 mEq/L at our institution. Her hyponatremia was initially managed with furosemide and water restriction. She was delivered at 33 weeks 5 days due to worsening preeclampsia and continued significant hyponatremia despite treatment. Her hyponatremia resolved within 48 h after delivery. Our objectives were to discuss trends, treatment, and outcomes of cases with hyponatremia in preeclampsia. We performed a systematic review of the literature using Ovid Medline (1963-2017), Scopus (1962-2017), and PubMed (1963-2017, including Cochrane database). Relevant articles describing any case report of hyponatremia in preeclampsia were identified from the above databases without any time, language, or study limitations. Studies were deemed eligible for inclusion if they described a case of hyponatremia in the setting of preeclampsia. 18 manuscripts detailing 55 cases were identified. Pertinent demographic data and laboratory values were extracted. Maternal management strategy, diagnosis, delivery, and neonatal outcome data were also collected. Mean, range, standard deviation, and percentage calculations were used as applicable. Advanced maternal age (46 %), nulliparity (79 %), and multifetal gestation (34 %) were noted in patients with preeclampsia and low sodium. Hyponatremia was detected on average at 34 weeks gestation. 64 % were diagnosed with preeclampsia with severe features. When reported, diagnoses related to hyponatremia were syndrome of inappropriate antidiuretic hormone secretion (41 %) or hypervolemic hyponatremia (59%). Indications for delivery included severe hyponatremia unresponsive to conservative measures in addition to other known obstetric or preeclamptic indications. Hyponatremia resolved within 48 h on average in cases where postpartum resolution was reported. It may be prudent to screen women with preeclampsia for electrolyte disturbances as part of their evaluation, especially in the setting of severe features. Initially, hyponatremia may be treated with medical management. In addition to established obstetric or preeclamptic indications, delivery may be considered if severe hyponatremia no longer responds to conservative measures. Copyright © 2020 Elsevier B.V.

Database: EMBASE

**Author(s):** Solomon, Neta; Many, Ariel; Orbach, Rotem; Mandel, Dror; Shinar, Shiri

**Source:** The journal of maternal-fetal & neonatal medicine: the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians; Aug 2019; vol. 32 (no. 16); p. 2711-2715

**Publication Date:** Aug 2019

**Publication Type(s):** Case Reports Journal Article

**PubMedID:** 29526150

**Abstract:**

**BACKGROUND**

Hyponatremia during labor and delivery may result in severe maternal and neonatal sequelae. Our aim was to describe the direct effect of hyponatremia in labor on pregnancy outcome.

**METHODS**

A case series of parturients diagnosed with hyponatremia during labor and their neonates. Clinical presentation, laboratory workup, and maternal and neonatal outcomes are presented.

**RESULTS**

Four parturients and their corresponding six neonates were diagnosed with hyponatremia. Of these, two cases were caused by water intoxication and two were preeclampsia induced. While two were identified due to maternal or neonatal symptoms, two were diagnosed by routine laboratory testing. In all cases, low maternal sodium resulted in similarly low neonatal sodium. Neonatal symptoms included respiratory distress syndrome (RDS), lethargy, and jaundice.

**CONCLUSION**

Psychogenic drinking during labor and preeclampsia may predispose to maternal hyponatremia, resulting in neonatal hyponatremia. Early recognition and treatment can prevent further maternal deterioration and adverse neonatal sequelae.

**Database:** Medline

17. Insatiable thirst: is obstetric hyponatraemia under recognised?

**Author(s):** Bosworth K.V.; Gohil S.; Ikram U.

**Source:** International Journal of Obstetric Anesthesia; Aug 2019; vol. 39; p. 59

**Publication Date:** Aug 2019

**Publication Type(s):** Conference Abstract

**Available at:** International Journal of Obstetric Anesthesia - from Unpaywall

**Abstract:**

**Introduction:** During labour, women are frequently encouraged to drink plenty to prevent dehydration. However, women may be at risk of developing dilutional hyponatraemia because of drinking excessive water. We describe a case of dilutional hyponatraemia secondary to excessive water ingestion in a midwife led unit (MLU). Case Report: A low-risk, 28 year old, nulliparous woman presented in spontaneous labour to the MLU. She initially used the pool for analgesia. However, as she became confused and non-communicative, she was removed from the pool and was transferred to labour ward where she was delirious and non-compliant. She required a caesarean section. Bloods taken before surgery later showed a sodium of 115 mmol/L. It was estimated that she had an oral intake of 10-12 L of water over 9 h. She was treated with boluses of 2.7% sodium chloride and transferred to the intensive care unit. Her serum sodium was within the normal range within 18 h and she made a full recovery. **Discussion(s):** Hyponatraemia is defined as blood sodium of less than 130 mmol/L.1 Women are at risk of dilutional hyponatraemia in the peripartum period for several reasons. They have a lower baseline sodium1 because they retain water in the third trimester leading to a lower plasma osmolarity.1 Oxytocin also has an antidiuretic effect,1 leading to further water retention. Furthermore, some women have the habit of drinking large quantities of water and are being encouraged to do so to prevent dehydration.1,2 Clinicians may be slow to recognise the symptoms of hyponatraemia as the vague neurological symptoms can be misinterpreted as the normal transition phase of labour, as in this case. This problem may be more common than clinicians
realise. An observational study found that 26% of women who had more than 2500 mL oral intake in labour had a sodium lower than 130 mmol/L.2 There are national guidelines from Northern Ireland that suggest checking serum sodium if the fluid balance is more than 1500 mL positive. However, there are no UK guidelines. Due to this case, the following recommendations were made in our department; dilutional hyponatraemia was publicised, it was agreed at a multi-disciplinary meeting that patient-led documentation of fluid balance was required on the MLU and lastly, an hourly reminder to document fluid balance on the electronic maternity record was instituted. This case highlights the importance of raising awareness about dilutional hyponatraemia. It raises questions about how women are advised to drink in labour, balancing the risk of dehydration. A sensible approach might be to focus on fluid balance monitoring in labour.

Copyright © 2019.

Database: EMBASE

18. Reducing the risk of peripartum hyponatraemia: an evaluation of fluid administration in labour

Author(s): Mehrotra P.; Salt R.; Kukreja Y.; Pillai A.


Publication Date: Aug 2019

Publication Type(s): Conference Abstract

Available at International Journal of Obstetric Anesthesia - from Unpaywall

Abstract: Introduction: Maternal hyponatraemia is now recognised as a life-threatening problem in the peripartum period. Our large (>10 000 births/year) units had five cases of severe symptomatic hyponatramia, with other asymptomatic cases over an 18-month period. Nationally, cases have been linked to excess fluid administration (IV and oral), triggering a national UKOSS review and guidance from GAIN,1,2 This guidance suggests that all IV fluid should be prescribed with an hourly rate, administered via a volumetric pump (except during acute resuscitation) and not routinely prescribed with epidurals. Method(s): A review of peripartum fluid administration in our trust was performed, to explore: (1) differences in volume of fluid received by women with and without an epidural; (2) documentation of fluid administration and prescription in women with a labour epidural; and (3) a region-wide survey of method of delivery of fluid in the peri-partum period. Result(s): Fluid administration was audited in 55 women. 49% had a fluid balance chart, and 56% had inadequate documentation of oral intake. Thirty of these women had epidurals. The mode volume of fluid administered to women without an epidural was 0-1000 mL, but with an epidural, this was 2000-3000 mL. Pearson’s chi-squared test showed that women with an epidural were significantly more likely to receive >2000 mL of IV fluid during labour, compared to those without an epidural. A separate audit of documentation in 15 women with an epidural showed that the mean volume of IV fluid administered was 2450 mL. The start time for each bag of fluid was documented 97% of the time. The end time was poorly documented (5%). 25 of the 39 fluid prescriptions had an hourly rate. A discrepancy was noted between the prescribed hourly rate and the time over which the fluid was administered in 11 cases. The survey of practice on labour suites found that of the five other trusts within our region questioned, volumetric pumps are not used for fluid administration on delivery suites at these sites. Discussion(s): This snapshot audit of practice in our large delivery suite has found inadequate documentation of fluid prescription and administration. Those with an epidural-in-situ were found to receive a larger volume of fluid. Discrepancies between the rate of fluid prescribed and administered could be explained by the lack of use of volumetric pumps in labour. This practice was found to be similar in labour suites across our region. Awareness of fluid administration in labour is imperative in reducing the risk of peripartum hyponatraemia.

Copyright © 2019.

Database: EMBASE

Author(s): Lassey, Sarah C; Napoe, Gnankang Sarah; Carusi, Daniela; Schantz-Dunn, Julianna; Robinson, Julian N

Source: Obstetrics and gynecology; Jul 2019; vol. 134 (no. 1); p. 106-108

Publication Date: Jul 2019

Publication Type(s): Case Reports Journal Article

PubMedID: 31188315

Available at Obstetrics and gynecology - from Ovid (LWW Total Access Collection 2019 - with Neurology)

Available at Obstetrics and gynecology - from Patricia Bowen Library & Knowledge Service West Middlesex University Hospital NHS Trust (lib302631) Local Print Collection [location] : Patricia Bowen Library and Knowledge Service West Middlesex university Hospital.

Abstract: BACKGROUND Hypovolemic hyponatremia has not been widely reported in the obstetric literature. Anecdotally, we noticed severe hyponatremia in several of our patients who presented as home birth transfers, leading to a review of home birth cases and hyponatremia. Given the morbidity associated with hyponatremia, it is important to be aware of its potential occurrence. CASE We present the cases of two patients transferred to our hospital with hyponatremia after prolonged labor. These women presented with altered mental status, somnolence, and decreased urine output. Both were admitted to the intensive care unit but made a full recovery. CONCLUSION Hyponatremia is a serious potential complication of prolonged labor. We propose mechanisms for this condition and recommendations for surveillance and prevention.

Database: Medline
20. **A rare cause of postpartum acute hyponatremia.**

**Author(s):** Rahmani Tzvi-Ran, Ilan; Olchowski, Judith; Fraenkel, Merav; Bashiri, Asher; Barski, Leonid

**Source:** Endocrinology, diabetes & metabolism case reports; Mar 2019; vol. 2019

**Publication Date:** Mar 2019

**Publication Type(s):** Journal Article

**PubMedID:** 30875679

Available at [Endocrinology, diabetes & metabolism case reports](https://onlinelibrary.wiley.com/doi/abs/10.1002/edm2.125) - from Europe PubMed Central - Open Access

Available at [Endocrinology, diabetes & metabolism case reports](https://onlinelibrary.wiley.com/doi/abs/10.1002/edm2.125) - from Unpaywall

**Abstract:** A previously healthy 24-year-old female underwent an emergent caesarean section without a major bleeding described. During the first post-operative days (POD) she complained of fatigue, headache and a failure to lactate with no specific and conclusive findings on head CT. On the following days, fever rose with a suspicion of an obstetric surgery-related infection, again with no evidence to support the diagnosis. On POD5 a new-onset hyponatremia was documented. The urine analysis suggested SIADH, and following a treatment failure, further investigation was performed and demonstrated both central hypothyroidism and adrenal insufficiency. The patient was immediately treated with hydrocortisone followed by levothyroxine with a rapid resolution of symptoms and hyponatremia. Further laboratory investigation demonstrated anterior hypopituitarism. The main differential diagnosis was Sheehan’s syndrome vs lymphocytic hypophysitis. Brain MRI was performed as soon as it was available and findings consistent with Sheehan’s syndrome confirmed the diagnosis. Lifelong hormonal replacement therapy was initiated. Further complaints on polyuria and polydipsia have led to a water deprivation testing and the diagnosis of partial central insipidus and appropriate treatment with DDAVP. Learning points: Sheehan’s syndrome can occur, though rarely, without an obvious major post-partum hemorrhage. The syndrome may resemble lymphocytic hypophysitis clinically and imaging studies may be crucial in order to differentiate both conditions. Hypopituitarism presentation may be variable and depends on the specific hormone deficit. Euvolemic hyponatremia workup must include thyroid function test and 08:00 AM cortisol levels.

**Database:** Medline

---

21. **Case report: Type 1 diabetic patient presented with atypical pre-eclampsia and complicated by hyponatraemia**

**Author(s):** De Senneville L.L.; Mehrotra C.

**Source:** Journal of Paediatrics and Child Health; Mar 2019; vol. 55; p. 119

**Publication Date:** Mar 2019

**Publication Type(s):** Conference Abstract


Available at [Journal of Paediatrics and Child Health](https://onlinelibrary.wiley.com/doi/abs/10.1111/ped.13886) - from Unpaywall

**Abstract:** Background: Pre-eclampsia is a multisystem progressive disorder which affects 4.6% of pregnancies worldwide. It is not an uncommon disease found in some women during pregnancy; however hyponatraemia secondary to pre-eclampsia presented antenally is rare with only few cases reported in the literature. Hyponatraemia in women with pre-eclampsia has significant implications on the maternal and fetal wellbeing causing decrease in maternal seizure threshold, fetal hyponatraemia, foetal jaundice, polyhydranmiosis and preterm labour. Therefore, a timely diagnosis and appropriate management is required. Case Report: We report a case of a 31-year-old Caucasian
patient, G1P0 at 35+6 weeks of gestation, with type 1 diabetes, presented for her routine antenatal clinic with 1 week history of weakness, several episodes of hypoglycaemia and weight gain of 4 kg. On examination she had moderate bilateral pitting oedema, hyperreflexia and was normotensive with a blood pressure of 125/75 mmHg. Whilst on the ward the patient developed a hypertensive crisis of 182/91 mmHg followed by severe hyponatraemia of 122 mmol/L; the decision for induction of labour was made. Result(s): Despite fluid restriction and tight control of her blood sugar level, the patient developed ketoacidosis and required immediate delivery via caesarean section. A 4kg male infant was delivered at 36+4 weeks gestation; with mild hyponatraemia of 130mmol/L, hypoglycaemia and neonatal jaundice which resolved spontaneously without much intervention. Conclusion(s): We believe that this is the first case reported of a Type 1 diabetic patient presented with atypical pre-eclampsia complicated by hyponatraemia. Further literature review is underway and will be ready for presentation at PSANZ 2019.

Database: EMBASE

22. Severe hyponatremia and ascites associated with preeclampsia

Author(s): Ghazali S.; Al-Domyati M.

Source: Crescent Journal of Medical and Biological Sciences; Jan 2019; vol. 6 (no. 1); p. 132-135

Publication Date: Jan 2019

Publication Type(s): Article

Abstract: Hyponatremia and ascites are rare findings in preeclampsia (PE) and have been suggested to be a feature of severity and associated with adverse pregnancy outcomes. The presence of both with PE was reported once in the literature. To our knowledge, this is the second case of PE with hyponatremia and ascites and the first case of recurrent ascites with PE. A 29-year-old gravida 2, para 1, was admitted with early-onset PE at 26 weeks of gestation. Admission labs revealed severe hyponatremia. Ultrasound showed significant maternal ascites and a growth-restricted fetus with abnormal umbilical artery Doppler. Few days later, the patient developed oliguria and had a cesarean section. The maternal hyponatremia was corrected after delivery and the ascites had completely resolved in her post-partum visit. Neonatal hyponatremia was also noted. The exact pathophysiology of these findings is unknown. Nephrotic syndrome with hypoalbuminemia may be the contributing factor. Copyright © 2019 The Author(s); This is an open-access article distributed under the terms of the Creative Commons Attribution License (http://creativecommons.org/licenses/by/4.0), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Database: EMBASE

23. Evaluating preeclampsia as a rare cause of severe hyponatremia
Author(s): De S.; Liaqat A.
Source: Journal of the American Society of Nephrology; 2018; vol. 29; p. 571-572
Publication Date: 2018
Publication Type(s): Conference Abstract

Abstract: Introduction: During normal pregnancy, resetting of osmostat can take place resulting in decrease of plasma osmolality by about 10 mOsm/kg, and mild decrease in serum sodium concentration by 4-5 meq/L. This phenomenon has been associated with increased production of hCG. Preeclampsia is a multisystem disorder defined by hypertension and proteinuria, but not classically associated with severe hyponatremia. However, there are rare incidences where severe hyponatremia is a complication of preeclampsia that can result in serious complications such as convulsions and cerebral edema. Case Description: The first case is about a 32-year old female of 27-week gestation who presented with preeclampsia with severe features. Due to worsening epigastric pain, HELLP syndrome and elevated blood pressure, patient had emergent C-section at 28-week gestation. Patient was also found to have severe hyponatremia with lowest serum sodium concentration of 120 meq/L on the day of C-section. She was initially treated with fluid restriction and diuretics; this resulted in overcorrection of sodium by 10 meq/L that was treated with hypotonic fluid and one dose of desmopressin. Gradually the correction of sodium slowed down and eventually corrected to 142 meq/L on the day of discharge. The second case is about a 29-year old female of 33-week gestation who also presented with preeclampsia with severe features. Due to breech presentation of the fetus and preeclampsia, patient had C-section at 34-week gestation. Patient initially had normal serum sodium concentration. Overtime sodium concentration decreased to 126 meq/L one day prior to C-section. Gradually, sodium improved appropriately with diuretics and fluid restriction to 136 meq/L 2 days after C-section. Discussion(s): The pathogenesis of preeclampsia associated severe hyponatremia has been widely postulated. It is important to understand the etiology of severe hyponatremia based on history and physical exam, which can help guide treatment. The main mechanisms yet to be understood. There is a theory that preeclampsia can stimulate non-osmotic release of ADH. Another theory suggests that defective placenta in preeclamptic patients is unable to produce enough vasopressinase that would rapidly inactivate ADH. Although the incidence of preeclampsia associated severe hyponatremia is reported rarely, it is a serious complication that needs to be addressed soon and managed promptly.

Database: EMBASE
24. Hyponatremia in pregnancy and the role of renal biopsy

**Author(s):** Pedley N.; Canetta P.A.; Crew R.J.; Stokes M.B.; Khairallah P.

**Source:** Journal of the American Society of Nephrology; 2018; vol. 29; p. 571

**Publication Date:** 2018

**Publication Type(s):** Conference Abstract

**Abstract:**

Introduction: Preeclampsia is a serious pregnancy complication that may mimic nephrotic syndrome. Severe hyponatremia in preeclampsia is rare and presents a unique clinical challenge as it increases the risk of seizures, mimicking eclampsia. It can also lead to several maternal and fetal adverse events. Case Description: We report the case of a 35yo G1P0 female who presented at 21 weeks of gestation with anasarca and vomiting. The pregnancy was conceived via in vitro fertilization and was uneventful until the day of presentation. She was found to be hypertensive to 152/84mm Hg with 4+ proteinuria on urine dispstick. Her labs were significant for creatinine of 0.7 mg/dL, serum albumin of 2.5 g/dL, Na of 117 mmol/L, and proteinuria of 12.5 g/g. Serum osmolality was 233 mOsm/Kg, UNa was <20 mmol/L and UOsm was 235 mOsm/Kg. Severe hyponatremia was secondary to low effective circulating volume from hypovolemia in the setting of vomiting and anasarca, and improved with albumin infusions. The combination of severe hyponatremia and proteinuria prompted a renal biopsy to identify the underlying cause of nephrotic syndrome. The biopsy showed diffuse severe glomerular thrombotic microangiopathy with endotheliosis, consistent with preeclampsia. The pregnancy was terminated with normalization of Na levels within 3 days postpartum and reduction in proteinuria to 2 g/g within 2 weeks postpartum. Discussion(s): This case is the earliest by gestational age at which preeclampsia-induced hyponatremia has been reported. The rarity of this complication, combined with the early gestational age of preeclampsia onset and the desire of the patient to maintain her pregnancy, necessitated a definitive diagnosis to explain her clinical picture. The renal biopsy proved critical in determining the diagnosis and best course of therapeutic action.

**Database:** EMBASE
25. Reducing the risk of peripartum hyponatraemia: An evaluation of fluid management during labour

Author(s): Salt R.; Pillai A.; Hoskins F.

Source: BJOG: An International Journal of Obstetrics and Gynaecology; Dec 2018; vol. 125; p. 43

Publication Date: Dec 2018

Publication Type(s): Conference Abstract

Abstract: Introduction Two cases of severe peripartum hyponatraemia linked to excess fluid occurred in our unit. Poor fluid balance documentation contributed to unrecognised overload. The physiological changes in pregnancy and labour pose risk of hyponatraemia, with reported maternal and neonatal seizures. There are currently no relevant RCOG guidelines. Review of fluid balance in labour within our unit was performed, to guide improvements to practice. Methods A retrospective review of 55 women delivering in midwifery- and consultant-led care between Jan-March 2018 was performed. Labours <6 hours were excluded to assess management of our highest risk women. Fluid balance documentation and use of IV fluids prior to delivery was recorded. Results Forty-four percent of women had fluid balance charts. All were in positive balance at delivery. 37% were >2000 ml positive. 56% of women had inadequate documentation of oral intake. 80% of women received IV fluids in labour, many without clear indication. 20% of women received >3 l IV fluid prior to delivery. Conclusion Fluid balance recording in labour was poor. Formal monitoring is required to calculate oral intake and determine overall balance. Significant volumes of IV fluid were given, often for treatment of urinary ketones, CTG abnormalities and in conjunction with low dose epidural anaesthesia, where, without hypotension there is no strong evidence or guidance. Trust guidance has been developed based on GAIN group guidance. This recommends fluid balance monitoring for all women, and sodium monitoring for those at risk of hyponatraemia. A UKOSS application for national study of peripartum hyponatraemia has been accepted.

Database: EMBASE
26. Severe hyponatraemia in the peri-partum patient: More common than we think?

Author(s): Blagnys H.; Constable N.

Source: Anaesthesia; Jul 2018; vol. 73 ; p. 91

Publication Date: Jul 2018

Publication Type(s): Conference Abstract

Available at Anaesthesia - from Wiley Online Library Science, Technology and Medicine Collection 2019

Abstract: Hyponatraemia is commonly encountered in clinical practice but, in the obstetric population, it may go unnoticed. There are confounding factors that clinicians should be aware of including physiological hyponatraemia of pregnancy, excess water intake and the use of synthetic oxytocin infusions. All differential diagnoses of seizures should be sought and ruled out when presented with such cases. In addition, the newborn child is at risk of hyponatraemia so the neonatal team should be informed. Description A 37-year-old previously fit and well primigravida had a full term baby by assisted kiwi delivery. Two hours postpartum she had a self-terminating generalised tonic-clonic seizure. The initial post-ictal period was uneventful, however her GCS did not increase to above 14 as she remained combative and confused. A sodium level of 114 mmol.l-1 was noted on arterial blood gas. She was intubated and ventilated to facilitate a CT head which showed a filling defect suspicious for thrombosis, but this was later reported as normal. Further history revealed a positive fluid balance of at least 4 l, increasing the likelihood of acute dilution hyponatraemia as the cause of her seizure. She was fluid restricted and quickly self diuresed, correcting her hyponatraemia from 118 to 135 mmol.l-1 within 12 h. In this case the neonate also had hyponatraemia which required treating with sodium supplementation and fluid restriction. Discussion Hyponatraemia of pregnancy is well documented and a decrease in plasma sodium level by 4 to 5 mmol.l-1 below normal levels is a physiological change [1]. Baseline sodium levels may not be known and confounding factors such as excess water intake may exacerbate an underlying hyponatraemia. In addition, common drugs used on the labour ward, including the synthetic oxytocin agent syntocinon, cause water retention and low sodium due to cross reactivity with the vasopressin receptor [2]. Other causes of seizures such as eclampsia, intracerebral bleeds and thrombosis need to be considered and treated as appropriate. Furthermore, it is important to recognise that the neonate is likely to be hyponatraemic in these cases. Observation for neonatal seizures and correction of electrolytes may be needed to prevent long term cerebral damage and thus good communication with the neonatal team is paramount.

Database: EMBASE
27. Oxytocin induced acute hyponatreinic convulsion in a healthy parturient

Author(s): Sutton T.G.; Butt K.M.; Nair U.P.

Source: International Journal of Obstetric Anesthesia; May 2018; vol. 35

Publication Date: May 2018

Publication Type(s): Conference Abstract

Abstract: Introduction: Acute hyponatremia during the peripartum period can occur due to iatrogenic fluid overload, prolonged oxytocin administration or excessive water intake. We report, acute water intoxication presenting as a convulsion during the peripartum period due to cerebral oedema in a healthy woman who had oxytocin augmentation during labour. Case report: A 36-year-old nulliparous woman was admitted for induction of labour for post maturity. Her past medical history was unremarkable and pregnancy was considered to be low risk. Induction was commenced with prostaglandin. Oxytocin 10IU in 0.9% saline 500 mL was commenced after spontaneous rupture of membranes to augment labour and the dose escalated according to hospital protocol. Fluid balance at the time was assumed to be 2.5 L positive mainly from oral intake. She had a tonic clonic seizure 11 h later which self-terminated in 2 min. A presumptive diagnosis of eclampsia was made and was treated with magnesium sulphate 8 g given over 12 min. Her vitals signs were stable with a heart rate of 70 beats/min and BP of 160/70 mmHg. She became increasingly agitated and an emergency caesarean was performed under GA which was uneventful. Postoperative head CT scan was normal. She remained intubated and ventilated overnight in ICU. Blood tests showed hyponatremia (Na 116 mmol/L) which was corrected with 0.9% sodium chloride. She was extubated the following morning and remained alert and oriented. Discussion(s): Water intoxication arises when there is retention of large amount of water in excess of electrolytes. Hyponatremia may develop if there is a source of electrolyte free water gain as polydipsia, secretion of antidiuretic hormone (ADH) and administration of drugs such as oxytocin which has antidiuretic action. Pregnancy is associated with expansion of total body water and inability to excrete excess water in third trimester. Labour and delivery produce pain, stress and nausea which all increase secretion of ADH increasing the permeability of collecting ducts in the kidney. Water is retained in excess of solutes, reducing plasma osmolality and predisposing to water intoxication especially if water intake is high as in this case. Symptoms usually present when serum sodium is 120 mmol/L or less. Drugs such as oxytocin, when given as infusion have a direct action on distal tubules causing reabsorption of water with the danger of water intoxication. This effect is measurable even at a low flow rates. All three factors contributed to hyponatremia in our case. Lowering of plasma osmolality and rapid fall in extracellular sodium concentration create a relative intracellular hypernatremia, with subsequent influx of water. This leads to intracellular hypotonicity, oedema and clinical symptoms of neuroexcitability, delirium, convulsion and coma. In our case sodium returned to near normal level following 0.9% saline infusion. This case highlights the antidiuretic property of oxytocin administered over a prolonged period that can seriously impair water and electrolyte balance and should be closely monitored for development of hyponatremia.

Database: EMBASE

28. Acute Hyponatremia in Puerperium: Sheehan's Syndrome

Author(s): Windpessl M.; Karrer A.; Schwarz C.

Source: American Journal of Medicine; Apr 2018; vol. 131 (no. 4)

Publication Date: Apr 2018

Publication Type(s): Article

PubMedID: 29253367

Database: EMBASE
29. Peripartum hyponatraemia: A case series

Author(s): Salt R.; Maronge L.; Pillai A.; El-Senoun G.

Source: BJOG: An International Journal of Obstetrics and Gynaecology; Apr 2018; vol. 125 ; p. 36

Publication Date: Apr 2018

Publication Type(s): Conference Abstract

Abstract: Objective Two cases of severe symptomatic peripartum hyponatraemia heralded a review of other known cases in our unit. Literature review highlights that pregnancy and labour pose a risk for hyponatremia due to changes in ADH secretion and oxytocin. Case reports describe resultant maternal and neonatal seizures. There is no RCOG guidance about the diagnosis and management of peripartum hyponatraemia but GAIN group guidance has been formulated via consensus from Northern Ireland. Methods We performed retrospective reviews of four cases of severe hyponatraemia (Na <125) presenting between March and November 2017 in our 11 000 delivery obstetric unit. We compared the cases for common features and reviewed how the adoption of GAIN guidance may have altered the diagnosis and management of these women. Results Of the four women, two presented with severe symptomatic hyponatraemia requiring ITU admission. Two had incidental diagnosis, but retrospectively had non-specific symptoms. Serum ranges were 116-124 mmol/l. Positive fluid balance was a common feature with poor written documentation. Two cases received syntocinon infusion. One had an epidural with concomitant IV fluids. In 2 cases ketonuria was treated with increased oral fluids. In 2 cases neonate was tested and treated for hyponatraemia. Conclusion All cases had identifiable risk factors from GAIN guidance which could have directed management. It is likely that other asymptomatic cases have occurred. We plan routine fluid balance charts for all labouring women. We have raised awareness of the symptoms of hyponatraemia and addressed the misconception of treating ketouria with fluid. Local adoption of GAIN guidance is planned.

Database: EMBASE
30. Exercise-Associated Hyponatremia in a Lactating Female.

**Author(s):** Bailowitz, Zach; Grams, Raymond; Teeple, David; Hew-Butler, Tamara

**Source:** Clinical journal of sport medicine : official journal of the Canadian Academy of Sport Medicine; Jul 2017; vol. 27 (no. 4); p. e55

**Publication Date:** Jul 2017

**Publication Type(s):** Case Reports Journal Article

**PubMedID:** 28653967

**Abstract:** A 37-year-old woman presented to the emergency department with severe headache, which quickly progressed to altered mental status and seizure activity in hospital. Her initial serum sodium concentration ([Na]) was 126 mmol/L. In the 24 hours before admission, she exercised vigorously for 120 minutes (interval training plus yoga) and also consumed more than 4 liters of fluid during that time to both stay hydrated and facilitate milk production because she was actively nursing 2 children. Her serum [Na] and altered mental status corrected slowly over the next 48 hours with furosemide, hypertonic saline, and fluid restriction. This case is unique because it discusses the possible pathogenic role that lactation-induced oxytocin release may have on sustained antidiuresis and dilutional exercise-associated hyponatremia (EAH). This would be the first report documenting EAH in a lactating woman, which may highlight an underrecognized risk factor for physically active women who are concurrently breast-feeding.

**Database:** Medline

31. Hyponatremia in labour: Have we made it worse?

**Author(s):** Keightley G.; Collis R.E.

**Source:** International Journal of Obstetric Anesthesia; May 2017; vol. 31

**Publication Date:** May 2017

**Publication Type(s):** Conference Abstract

**Abstract:** Introduction: Hyponatraemia is not commonly recognised during pregnancy or labour but can have serious consequences for mother and baby.1 In January 2015 we changed guidelines on fluid administration in labour from intravenous to oral intake of clear fluids, where possible, because of a number of cases of iatrogenic fluid overload. At the same time liberal oral fluid in the water birth setting was encouraged because of national recommendations. It appeared that there was an increase in symptomatic and incidental hyponatraemia after the change so an audit was conducted to evaluate this. Method(s): This project was registered with the local audit department. All women with serum sodium of <130mmol/L were identified from biochemistry records: over a four-year period from January 2013 to December 2016, two years before and two years after the change. A comparison between the groups was made. Result(s): The birth rate of around 6000 deliveries has been similar across this time period. Sixty-two women (0.5% of deliveries) had a serum sodium level <130mmol/L before the change and 143 women after (1.2% of deliveries). Before the change, 56 patients (90.3%) had mild hyponatraemia (sodium 125-130mmol/L), six (9.7%) had moderate hyponatraemia (sodium 115-124mmol/L) with no cases of severe hyponatraemia (sodium <115mmol/L). After the change, 118 patients (82.5%) had mild hyponatraemia, 24 patients (16.8%) moderate hyponatraemia and one case of severe hyponatraemia (sodium 103mmol/L).

**Discussion(s):** There has been an increase in the identification of hyponatraemia in labouring women since January 2015 which mirrored our impression. Urea and electrolyte tests are not routinely
taken in labour unless the women is unwell or has possible preeclampsia, sepsis or poor urine output. The increase in detection could be because of an increase in the number of tests but it is concerning that there are an increase in the number with moderate hyponatremia and a severe case, who became unwell during a water birth. It is well known that oxytocin, both natural and artificial, can have an anti-diuretic effect and a syndrome of inappropriate secretion of anti-diuretic hormone (SIADH) can be caused by pain, nausea, stress and fear.1,2 Both will cause water retention and hyponatraemia if excessive non-electrolyte containing clear fluids are consumed. Hyponatremia can be life threatening and can cause fits in the mother and neonate after delivery, both of which we have seen. There is no research on the optimal quantity or type of fluid that labouring women should consume but women in all our labour settings will now have an oral input record kept to facilitate future audit and possible research.

Database: EMBASE

32. Severe Hyponatremia Associated with Use of Black Cohosh during Prolonged Labor and Unsuccessful Home Birth.

**Author(s):** Blitz, Matthew J; Smith-Levitin, Michelle; Rochelson, Burton

**Source:** AJP reports; Mar 2016; vol. 6 (no. 1); p. e121

**Publication Date:** Mar 2016

**Publication Type(s):** Case Reports

**PubMedID:** 26989565

Available at [AJP reports](https://ajpreports.com) - from Europe PubMed Central - Open Access

Available at [AJP reports](https://ajpreports.com) - from Unpaywall

**Abstract:**

**Introduction**

There has been an increase in the use of herbal supplements during pregnancy, which are frequently of unproven efficacy and safety. We present a case of severe hyponatremia and altered mental status associated with the use of black cohosh during prolonged labor. Case

A 39-year-old primigravida at 38(5/7) weeks of gestational age presented to the emergency department after she became disoriented and lethargic while laboring at home with a midwife. She had consumed several doses of black cohosh to induce and augment labor. On presentation, she was nonverbal and unable to follow commands. Her serum sodium was 114 mmol/L (range, 132-145 mmol/L), serum osmolality was 253 mOsm/kg (range, 275-300 mOsm/kg), urine osmolality was 190 mOsm/kg (range, 300-900 mOsm/kg), and urine sodium was <10 mmol/L. The patient soon became uncooperative and combative and a cesarean section was performed. Postoperatively, she was transferred to the intensive care unit for monitoring and correction of her sodium. Her mental status returned to baseline and she was subsequently discharged home without further complication. Discussion

Clinically significant hyponatremia associated with pregnancy is rare. Further investigation is needed to evaluate the safety and efficacy of black cohosh and other commonly used herbal supplements during pregnancy and labor.

**Database:** Medline
33. Approach to the diagnosis and treatment of hyponatremia in pregnancy

**Author(s):** Pazhayattil G.S.; Rastegar A.; Brewster U.C.

**Source:** American Journal of Kidney Diseases; Apr 2015; vol. 65 (no. 4); p. 623-627

**Publication Date:** Apr 2015

**Publication Type(s):** Article

**PubMedID:** 25542410

**Abstract:** Hyponatremia is the most commonly encountered electrolyte abnormality. Severe hyponatremia in pregnancy poses diagnostic and therapeutic challenges. Pregnancy involves changes in physiology that affect water and sodium homeostasis. Knowledge of these complex physiologic alterations during pregnancy is critical to managing dysnatremias in pregnancy. This teaching case describes a woman with chronic hyponatremia who presented during pregnancy with worsening hyponatremia. She had an activating vasopressin receptor mutation, which was passed on to her child, and her diagnostic workup is described. Copyright © 2015 National Kidney Foundation, Inc.

**Database:** EMBASE

34. Acute hyponatraemia in labour secondary to water intoxication: A case report

**Author(s):** Kamdar T.; Burton D.J.

**Source:** BJOG: An International Journal of Obstetrics and Gynaecology; Apr 2015; vol. 122; p. 184

**Publication Date:** Apr 2015

**Publication Type(s):** Conference Abstract

**Abstract:** Introduction Hyponatraemia due to water intoxication is an increasingly recognised problem in labouring women. We report a case of hyponatraemia in labour presenting in an unusual way significantly affecting obstetric, anaesthetic and neonatal management. Case A normally fit and well 26-year-old Caucasian primiparous female was transferred to a tertiary hospital delivery suite from a primary birthing unit, for a prolonged first stage of labour at 41/40 gestation. Prior to admission she had consumed large quantities of sports drinks and water due to the belief that this would shorten the duration of labour and promote uterine activity. Shortly prior to her admission she became lethargic and uncommunicative. This was initially attributed to fatigue from a prolonged first stage of labour. A syntocinon infusion in normal saline was administered for 2 hours. Following this, the obstetric team requested regional anaesthesia for instrumental delivery due to failure to progress in second stage. Inability to communicate with the patient prompted investigation of the cause of her mutism and lethargy. Her serum sodium returned as 120 mmol/L and dilutional hyponatraemia secondary to water intoxication was diagnosed. Ultimately the patient's inability to consent for and to cooperate with both regional anaesthesia and assisted vaginal delivery prompted emergency delivery by caesarian section under general anaesthesia. The hyponatraemia was corrected, without the feared complication of central pontine myelinolysis, using hypertonic saline and fluid restriction. Interestingly the neonate was also found to be hyponatraemic and required a period of continuous positive airway pressure (CPAP) ventilation and oral sodium supplementation in the newborn unit. Conclusion Hyponatraemia is an increasingly recognised and yet frequently undiagnosed complication in labouring women, one which, as in this case, may have significant implications for the anaesthetic and obstetric care of both the mother and child. A review of the literature is presented as well as the underlying pathophysiology in relation to sodium and water
metabolism in labour. This case should be of interest to anyone responsible for the care of labouring women as unrecognised hyponatraemia poses risks of seizures and death to both mother and child. It should alert caregivers that in cases of prolonged labour lack of communication or peculiar behaviour should not be attributed to fatigue or pain alone, but the differential of electrolyte disturbance should be explored. Furthermore, guidelines should be initiated for monitoring fluid intake in early labour under primary care.

Database: EMBASE

35. Managing severe peripartum hyponatraemia: A case report

Author(s): Snow T.A.; Lim J.; Laing C.M.; MacCallum N.S.; Brealey D.A.
Source: Obstetric Medicine; Dec 2014; vol. 7 (no. 4); p. 171-173
Publication Date: Dec 2014
Publication Type(s): Article
Available at Obstetric Medicine - from Europe PubMed Central - Open Access
Available at Obstetric Medicine - from Unpaywall

Abstract: We present a case of severe peripartum hyponatraemia that occurred following a major obstetric haemorrhage causing both an ischaemic stroke and Sheehan's syndrome and outline the investigations and management strategy required. Copyright © The Author(s) 2014 Reprints and permissions: sagepub.co.uk/journalsPermissions.nav.

Database: EMBASE

36. Severe postpartum symptomatic hyponatremia due to DDAVP

Author(s): Gupta S.; Barnes M.
Source: American Journal of Kidney Diseases; May 2014; vol. 63 (no. 5)
Publication Date: May 2014
Publication Type(s): Conference Abstract

Abstract: DDAVP or desmopressin is an antidiuretic hormone analogue that is widely used to treat central diabetes insipidus, hemophilia, von Willebrand's disease and nocturnal enuresis. DDAVP induced hyponatremia has been well described. We present a case of severe symptomatic hyponatremia secondary to incorrect dosing of DDAVP following pregnancy. A twenty two year old female presented to the emergency room with complaints of nausea, vomiting and lightheadedness. The patient denied any history of trauma, headache, vision changes, abdominal pain or diarrhea. Her past medical history was significant for histiocytosis X involving the pituitary gland causing central diabetes insipidus, diagnosed at age three. She had a spontaneous vaginal delivery of a normal healthy child ten days prior to admission following an uneventful pregnancy. In the triage bay, she had a seizure and was noted to have severe hyponatremia with sodium of 109. CT scan of the head, thyroid stimulating hormone, serum cortisol, magnesium, B12 and ionized calcium were normal. Further questioning revealed that when she became pregnant her DDAVP dose was doubled which she apparently continued to take postpartum. In addition she had increased her fluid intake due to feeling dehydrated. DDAVP doses often need to be increased during pregnancy secondary to increased production of vasopressinase by the placenta. This case emphasizes the importance of close monitoring and correct dosing of desmopressin. It also highlights the importance of educating the patient and physicians about the need for free water restriction to avoid such life threatening adverse events.

Database: EMBASE
Abstract: Maternal hyponatraemia during labour can affect both mother and baby. As a result, standard intrapartum care includes administration of oxytocin in sodium-containing fluids, limitation of oral intake and use of isotonic sports drinks. There is no strict guidance on best practise and local protocols vary. We present a case report of acute severe hyponatraemia following spontaneous vaginal delivery at 38+5 weeks gestation in a 34-year-old primiparous woman. This previously well woman spent 4.5 hours in the birthing pool and drank approximately 6 litres of water/lucozade in that time. After delivery, she suffered a seizure and acute confusion. The plasma sodium was 117 mmol/L (135-145 mmol/l). This was corrected with hypertonic saline to 130 mol/L within 4 hours. She was admitted to intensive care and required sedation and ventilation. Endocrine investigations revealed no underlying cause. Differential diagnoses included atypical eclampsia and posterior-reversible encephalopathy syndrome. She was discharged on day 6 with a Mini-mental State Examination score of 30/30. Isotonic drinks prevent urinary ketosis, maintain plasma glucose and electrolytes, thereby preventing the 'starvation effect' of labour, also seen in marathon runners. Review of the literature relating to the effect of water immersion and oral fluid intake on plasma sodium levels during labour suggests that a 40-minute bath may cause increased naturiesis and plasma volume expansion. Water tolerance appears diminished in labour and thus intoxication may be possible with relatively moderate volumes. We recommend that in labour a) women do not drink excessively, b) hypotonic fluid administration is avoided, c) fluid-balance charts become mandatory.

Database: EMBASE
38. Pre-eclampsia associated with severe hyponatremia

**Author(s):** Thiruveedi S.; Benz R.L.

**Source:** American Journal of Kidney Diseases; Apr 2013; vol. 61 (no. 4)

**Publication Date:** Apr 2013

**Publication Type(s):** Conference Abstract

**Abstract:** Hyponatremia can result from any CNS disorder and several endocrine disorders. Pre-eclampsia associated with severe hyponatremia is seldom seen with very few documented cases on our literature search. There is no prior reported case with initial serum sodium of 116 in the setting of pre-eclampsia and here we present one such rare case. A 26 year old Indian nulliparous female with well controlled hypothyroidism and uneventful pregnancy until 30 weeks of gestation presents with 5 days of vomiting, edema, lethargy, and decreased urine output. On examination BF was 160/100. She had anasarca and encephalopathy but without focal neurological deficit. Sodium was 116, bicarbonate 16, urine protein creatinine ratio 6.49 gm/gm, urine osmolality 429, serum osmolality 251, urine sodium <10 and uric acid 8.4. TSH, Cortisol and MRI brain were normal. Although SIADH is possible with higher urine osmolality than serum osmolality, she was initially presumed to have decreased effective circulatory volume with nephrotic syndrome and preeclampsia as suggested by low urine sodium and high uric acid (which could also be from preeclampsia). She was initially volume resuscitated with normal saline at 100 ml/hour under close CVP monitoring in ICU with frequent electrolyte measurements. She received magnesium for seizure prophylaxis and steroids for fetal lung maturity. Follow-up lab work supports the diagnosis of SIADH with urine osmolality 529, serum osmolality 280, and urine sodium 55. Subsequent mainstay of the treatment was free water restriction to 1 liter daily for the next 3 days. She had uneventful cesarean section 72 hours later when serum sodium was 137. She had complete resolution of SIADH after delivery. The pathophysiology of SIADH in pre-eclampsia is poorly understood. Clinical management of severe hyponatremia is challenging with the obstetrician balancing threat of eclampsia and its associated risk to mother & fetus versus timing of delivery while waiting for a safer sodium level to induce. The nephrologist has limited therapeutic armamentarium in case of emergency. Furosemide and hypertonic saline are category c drugs while conivaptan and demeclocycline are contraindicated in pregnancy. Both mother & baby experienced healthy outcomes with free water restriction and timely induction of labor described herein.

**Database:** EMBASE

39. A pinch of salt

**Author(s):** Paul S.P.; Smith B.A.; Luthra K.K.

**Source:** The practising midwife; Feb 2013; vol. 16 (no. 2); p. 13-16

**Publication Date:** Feb 2013

**Publication Type(s):** Article

**PubMedID:** 23461229

**Abstract:** Pregnant women in labour are generally encouraged by their carers to continue taking plenty of oral fluids. This is sometimes supplemented by intravenous fluids either due to a clinical necessity or in preparation for a caesarean section. It is important that there is clear documentation of the amount of fluids received by pregnant women in the perinatal period as excessive maternal fluid has been associated with low serum sodium in neonates. This often goes under-recognised; therefore it is important to consider this in a neonate presenting with hyponatraemia in the first day of life. Presented here is a case of neonatal hyponatraemia secondary to excessive fluid taken in the perinatal period.
40. Late-onset Sheehan's syndrome presenting with rhabdomyolysis and hyponatremia: a case report.

Author(s): Soresi ; Brunori, Giuseppe; Citarrella, Roberto; Banco, Aurelia; Zasa, Antonino; Di Bella, Giovanna; Giannitrapani, Lydia

Source: Journal of Medical Case Reports; Jan 2013; vol. 7 (no. 1); p. 227-227

Publication Date: Jan 2013

Publication Type(s): Academic Journal

PubMedID: NLM24083446

Available at Journal of medical case reports - from BioMed Central
Available at Journal of medical case reports - from SpringerLink - Medicine
Available at Journal of medical case reports - from Europe PubMed Central - Open Access
Available at Journal of medical case reports - from Unpaywall

Abstract: Introduction: Hyponatremia associated with rhabdomyolysis is a rare event and a correct diagnostic approach is required to rule out this or other diseases as a primary cause and to avoid other complications resulting from a lack of appropriate treatment. Case Presentation: A 64-year-old Caucasian woman presented to our facility with worsening fatigue, slurred speech, nausea and vomiting, and high serum levels of creatine kinase and myoglobin together with hyponatremia. Normal arterial blood gas analysis results, normal serum potassium levels, increased urine sodium levels, urine specific gravity of >1003N/m3 and low urine volume suggested an endocrine etiology. Her low cortisol and thyroid hormone serum levels suggested a pituitary disorder. A magnetic resonance imaging study showed atrophy of her pituitary gland. A more detailed study of our patient's obstetric history revealed a post-partum hemorrhage 30 years earlier. She was diagnosed as having late-onset Sheehan's syndrome and treated with hormone replacement therapy, which normalized her clinical picture. Conclusions: This case report shows that, in hyponatremia-associated rhabdomyolysis, an endocrinological origin should always be considered. This should include Sheehan's syndrome as it can occur with late onset.

Database: CINAHL

41. A case of postnatal hyponatraemia

Author(s): Livingstone C.

Source: CPD Bulletin Clinical Biochemistry; 2011; vol. 10 (no. 2); p. 67-68

Publication Date: 2011

Publication Type(s): Article

Database: EMBASE
42. A case of postpartum hyponatremia in diabetes insipidus

Author(s): Chandrasekhar A.; Soler S.; Miller M.; Gopalakrishnan G.

Source: Endocrine Reviews; Jun 2011; vol. 32 (no. 3)

Publication Date: Jun 2011

Publication Type(s): Conference Abstract

Abstract: Background: Knowledge of how pregnancy affects vasopressin (AVP) metabolism is essential for management of patients with pre-existing diabetes insipidus (DI). The placenta produces vasopressinase, a cystine aminopeptidase which inactivates AVP. Vasopressinase levels increase 1000-fold in pregnancy, peak at term, and decline by one month postpartum. Desmopressin (DDAVP) is the drug of choice for treatment of DI during pregnancy, and is resistant to degradation by vasopressinase. We present a case of iatrogenic hyponatremia in a pregnant subject with pre-existing DI on DDAVP.

Clinical Case: A 21 year-old female at 38 weeks' gestation underwent successful caesarean section. The patient’s past medical history was significant for central diabetes insipidus diagnosed at age six secondary to infiltration of the hypothalamic-pituitary axis from Histiocytosis X. During pregnancy, her DDAVP dose was increased from one spray twice daily to four times daily. Peri-operatively, she received two liters of normal saline. On post-op day one, she took three sprays of DDAVP. On post-op day two, her serum sodium levels decreased from 134 to 122 over a 24-hour period. Laboratory values were as follows: serum osmolality of 248 mOsm (n 275-295), urine osmolality of 981 mOsm (n 50-1400), urine sodium of 38 (n 10-40 mEq/L), and urine specific gravity of 1.016 (n 1.010-1.020). The patient remained asymptomatic and was clinically euvolemic. She was placed on fluid restriction. Serum sodium normalized to 135 over a 36-hour period. Her DDAVP dose was decreased to one spray daily, and she was discharged.

Conclusion(s): We conclude that increased DDAVP and IV fluids during labor caused an excess of free water relative to sodium, resulting in severe hyponatremia post-partum. Frequent monitoring of serum and urine electrolytes is critical in the management of DI patients on DDAVP during labor and delivery. Vasopressinase causes increased AVP requirements ante-partum, and decreased requirements post-partum. Therefore, titration of DDAVP dosing during and after pregnancy may be necessary. The rate of metabolic clearance of DDAVP increases only minimally during pregnancy, supporting the idea that vasopressinase primarily affects degradation of endogenous AVP. Increased awareness of the potential consequences of excess DDAVP and IV fluid administration in pregnant subjects with DI is crucial for prevention and diagnosis of iatrogenic hyponatremia.

Database: EMBASE
43. Late occurrence of severe hyponatremia followed by extrapontine osmotic demyelination syndrome after successful conservative management of postpartum hemorrhage due to placenta accreta by uterine artery embolization.

Author(s): Imoto, Sanae; Takeda, Akihiro; Koyama, Kazuyuki; Taguchi, Seiko; Horibe, Kentaro; Nakamura, Hiromi

Source: The journal of maternal-fetal & neonatal medicine : the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians; Jul 2010; vol. 23 (no. 7); p. 742-746

Publication Date: Jul 2010

Publication Type(s): Case Reports Journal Article

PubMedID: 19757336

Abstract: Development of severe hyponatremia followed by extrapontine osmotic demyelination syndrome was reported as a significant late complication after successful conservative management of postpartum hemorrhage due to placenta accreta by uterine artery embolization.

Database: Medline

44. Pre-eclampsia presenting as hyponatremia: An uncommon presentation of pre-eclampsia in a twin pregnancy - A case report and review of the literature

Author(s): Jhaveri K.D.; Wanchoo R.; Aelion A.

Source: Clinical Nephrology; 2009; vol. 72 (no. 6); p. 492-496

Publication Date: 2009

Publication Type(s): Article

PubMedID: 19954728

Abstract: Pre-eclampsia affects 5-8% of pregnancies in the USA and 3-14% of pregnancies worldwide. Classically, the syndrome includes hypertension and proteinuria that may be associated with edema, headache and worsening epigastric pain. This is postulated from vasospasm and endothelial cell damage. Hyponatremia in pre-eclamptic pregnancies has been described in few cases, most of which were twin pregnancies, and four of them had nephrotic syndrome. The management of hyponatremia requires a multidisciplinary approach and significant attention, as this condition can predispose to convulsions along with pre-eclampsia, thus, endangering the life of the mother and the child. We describe a case of a patient who developed preeclampsia and hyponatremia in the absence of proteinuria, at 34 weeks of a twin pregnancy; there was progression to oliguria with complete remission following delivery by cesarean section. © 2009 Dustri-Verlag Dr. K. Feistle.

Database: EMBASE
45. The case: a female with hyponatremia. Diagnosis: Postpartum panhypopituitarism (Sheehan syndrome).

**Author(s):** Bamoulid, Jamal; Courivaud, Cécile; Kazory, Amir; Bonneville, Jean F; Ducloux, Didier

**Source:** Kidney international; Aug 2009; vol. 76 (no. 3); p. 351-352

**Publication Date:** Aug 2009

**Publication Type(s):** Case Reports Journal Article

**PubMedID:** 19904259

Available at [Kidney International](https://www.proquest.com) - from ProQuest (Health Research Premium) - NHS Version

Available at [Kidney International](https://www.unpaywall.org) - from Unpaywall

**Database:** Medline

46. Oxytocin infusion: acute hyponatraemia, seizures and coma.

**Author(s):** Bergum, D; Lonnéé, H; Hakli, T F

**Source:** Acta anaesthesiologica Scandinavica; Jul 2009; vol. 53 (no. 6); p. 826-827

**Publication Date:** Jul 2009

**Publication Type(s):** Case Reports Journal Article

**PubMedID:** 19397503

Available at [Acta Anaesthesiologica Scandinavica](https://onlinelibrary.wiley.com) - from Wiley Online Library Science, Technology and Medicine Collection 2019

**Abstract:** Hyponatremia is not uncommon, serious cases can cause dangerous complications as seizures, brain damage and even death. We present a case of a young mother with post partum hemorrhage and some of the serious complications.

**Database:** Medline
47. Hyponatremia complicating labour—rare or unrecognised? A prospective observational study.

**Author(s):** Moen, V; Brudin, L; Rundgren, M; Irestedt, L

**Source:** BJOG : an international journal of obstetrics and gynaecology; Mar 2009; vol. 116 (no. 4); p. 552-561

**Publication Date:** Mar 2009

**Publication Type(s):** Journal Article Research Support, Non-u.s. Gov't

**PubMedID:** 19175600

Available at [BJOG : an international journal of obstetrics and gynaecology](https://onlinelibrary.wiley.com/doi/10.1111/j.1471-0528.2009.02157.x) - from Wiley Online Library Science, Technology and Medicine Collection 2019

Available at [BJOG : an international journal of obstetrics and gynaecology](https://onlinelibrary.wiley.com/doi/10.1111/j.1471-0528.2009.02157.x) - from Unpaywall

**Abstract:**

**OBJECTIVE**
The aim of this study was to investigate the occurrence of hyponatraemia following delivery, with a hypothesis that hyponatraemia has a high prevalence in labouring women.

**DESIGN**
Prospective observational study.

**SETTING**
Consultant-led delivery suite in County Hospital, Kalmar, Sweden.

**SAMPLE**
A total of 287 pregnant women at term (37 full gestational weeks).

**METHODS**
Oral fluids were allowed during labour. Blood samples were collected on admission, after delivery, and from the umbilical artery and vein.

**MAIN OUTCOME MEASURE**
Hyponatraemia defined as plasma sodium $\leq 130$ mmol/l after delivery.

**RESULTS**
Hyponatraemia was found in 16 (26%) of the 61 mothers who received more than 2500 ml of fluid during labour. Two-thirds of fluids were orally ingested. Decrease in plasma sodium concentration during labour correlated with duration of labour and the total fluid volume administered. Analysis by multivariate logistic regression showed that hyponatraemia was significantly correlated with fluid volume ($P < 0.001$) but not with oxytocin administration or epidural analgesia. Hyponatraemia correlated significantly with prolonged second stage of labour, instrumental delivery, and emergency caesarean section for failure to progress ($P = 0.002$).

**CONCLUSIONS**
Hyponatraemia is not uncommon following labour. Tolerance to a water load is diminished during labour; therefore, even moderate fluid volumes may cause hyponatraemia. Women should not be encouraged to drink excessively during labour. Oral fluids, when permitted, should be recorded, and intravenous administration of hypotonic fluids should be avoided. When abundant drinking is unrecognised or intravenous fluid administration liberal, life-threatening hyponatraemia may develop. The possibility that hyponatraemia may influence uterine contractility merits further investigation.

**Database:** Medline

48. Hyponatremia complicating vaginal delivery.

**Author(s):** Green, Andrew; Popham, Philip

**Source:** International journal of obstetric anesthesia; Jan 2008; vol. 17 (no. 1); p. 93-94

**Publication Date:** Jan 2008

**Publication Type(s):** Letter Case Reports Comment

**PubMedID:** 18162206

**Database:** Medline
49. Water intoxication-a dangerous condition in labor and delivery rooms.

**Author(s):** Ophir, Ella; Solt, Ido; Odeh, Marwan; Bornstein, Jacob

**Source:** Obstetrical & gynecological survey; Nov 2007; vol. 62 (no. 11); p. 731-738

**Publication Date:** Nov 2007

**Publication Type(s):** Journal Article Review

**PubMedID:** 17925046

Available at Obstetrical & gynecological survey - from Ovid (LWW Total Access Collection 2019 - with Neurology)

**Abstract:** Water intoxication, a form of acute hyponatremia, has been described in various clinical situations. Although hyponatremia is a common metabolic disorder in hospitalized patients, it is generally not well known as a hazard in the labor and delivery room. However, several factors predispose laboring women to develop hyponatremia. Moreover, because the fetus acquires water from the maternal circulation via the placenta, and there is a close correlation between maternal and cord blood serum sodium levels, the newborn infant of a hyponatremic mother is also at considerable risk of developing water intoxication. We review the epidemiology, pathophysiology, clinical features, and treatment of this hazardous disorder. We emphasize the need for awareness of this condition, and call attention to the risk of fluid overload during labor.

**Database:** Medline

50. Hyponatremia and preeclampsia.

**Author(s):** Ravid, Dorit; Massarwa, Lacra-Elena; Biron-Shental, Tal; Fejin, Moshe D

**Source:** The journal of maternal-fetal & neonatal medicine: the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians; Jul 2005; vol. 18 (no. 1); p. 77-79

**Publication Date:** Jul 2005

**Publication Type(s):** Case Reports Journal Article

**PubMedID:** 16105796

Available at The journal of maternal-fetal & neonatal medicine: the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians - from ProQuest (Health Research Premium) - NHS Version

**Abstract:** A 33-year-old healthy woman, gravida 1 with twins pregnancy was admitted with mild preeclampsia and unusual hyponatremia which resolved promptly postpartum. This is the seventh reported case of hyponatremia complicating preeclampsia, four of the patients carried twins and four had nephrotic syndrome.

**Database:** Medline
51. **Severe hyponatraemia as a result of primary polydipsia in labour.**

**Author(s):** Graham, Kathryn; Palmer, John

**Source:** The Australian & New Zealand journal of obstetrics & gynaecology; Dec 2004; vol. 44 (no. 6); p. 586-587

**Publication Date:** Dec 2004

**Publication Type(s):** Case Reports Journal Article

**PubMedID:** 15598305

Available at [The Australian & New Zealand journal of obstetrics & gynaecology](https://auan.org.au) - from Wiley Online Library Science, Technology and Medicine Collection 2019

Available at [The Australian & New Zealand journal of obstetrics & gynaecology](https://auan.org.au) - from Patricia Bowen Library and Knowledge Service West Middlesex University Hospital NHS Trust (lib302631) Local Print Collection [location] : Patricia Bowen Library and Knowledge Service West Middlesex university Hospital.

**Database:** Medline

---

52. **Postpartum acute kidney failure and hyponatremia: a clinical enigma.**

**Author(s):** Korem, Maya; Ackerman, Zvi; Sciaki-Tamir, Yael; Gino, Gabriel; Salameh-Giryes, Shaden; Perlberg, Saul; Heyman, Samuel N

**Source:** The Israel Medical Association journal : IMAJ; Oct 2004; vol. 6 (no. 10); p. 639-641

**Publication Date:** Oct 2004

**Publication Type(s):** Case Reports Journal Article

**PubMedID:** 15473598

**Database:** Medline

---

53. **Severe hyponatraemia and pre-eclampsia**

**Author(s):** Burrell C.; De Swiet M.

**Source:** BJOG: An International Journal of Obstetrics and Gynaecology; Sep 2004; vol. 111 (no. 9); p. 1020-1022

**Publication Date:** Sep 2004

**Publication Type(s):** Article

**PubMedID:** 15327622

Available at [BJOG : an international journal of obstetrics and gynaecology](https://onlinelibrary.wiley.com) - from Wiley Online Library Science, Technology and Medicine Collection 2019

**Database:** EMBASE

**Author(s):** Munz, W; Seufert, R; Knapstein, P-G; Pollow, K

**Source:** Experimental and clinical endocrinology & diabetes : official journal, German Society of Endocrinology [and] German Diabetes Association; May 2004; vol. 112 (no. 5); p. 278-280

**Publication Date:** May 2004

**Publication Type(s):** Case Reports Journal Article

**PubMedID:** 15146375

**Abstract:** In modern day health care, Sheehan's syndrome is a rare disorder affecting the postpartum period. We present a case of a 33-year-old woman with atonic hemorrhage developing a transient Sheehan's syndrome associated with hyponatremia six days postpartum. Evaluation of cranial computer tomography and magnetic resonance imaging of the pituitary demonstrated normal finding. Immediate replacement therapy using sodium, chloride, hydrocortisone, fludrocortisone and levothyroxine revealed regression of the Sheehan's syndrome to complete recovery. The present report shows that Sheehan's syndrome can be associated with hyponatremia and illustrates the need to include hyponatremia as an initial symptom in the differential diagnosis of Sheehan's syndrome.

**Database:** Medline

55. Hyponatremia and hypoglycemia in acute Sheehan’s syndrome

**Author(s):** Bunch T.J.; Gosman R.I.; Dunn W.F.; Basu A.

**Source:** Gynecological Endocrinology; Oct 2002; vol. 16 (no. 5); p. 419-423

**Publication Date:** Oct 2002

**Publication Type(s):** Article

**PubMedID:** 12587538

**Abstract:** We report the case of a 23-year-old Saudi Arabian woman who presented to the medical intensive care unit with severe hyponatremia and hypoglycemia following a Cesarean section delivery complicated by hemorrhage due to disseminated intravascular coagulopathy. She was treated successfully for adrenal insufficiency acutely, and was later discharged on hormone replacement therapy. To our knowledge, this is the first case report of acute Sheehan's syndrome presenting with both hyponatremia and suggestive hypoglycemia. Pituitary necrosis is an uncommon complication of peripartum hemorrhagic shock. Since the initial description by Sheehan in 1937, the incidence of the syndrome has gradually declined through improved management of hemodynamic complications leading to the infarction of the gland1,2. There are many studies describing complications of late Sheehan's syndrome; however, relatively few contain descriptions of the acute phase. In addition, the diagnosis of this syndrome is often determined after resolution of the acute process with resultant lack of data regarding immediate endocrine and imaging abnormalities3. In this report, we describe the complete endocrine and imaging assessment of a patient presenting in critical condition due to necrosis of the pituitary gland in the immediate postpartum period.

**Database:** EMBASE
56. Symptomatic hyponatremia following cesarean section.

Author(s): Lurie, S; Feinstein, M; Mamet, Y

Source: The journal of maternal-fetal & neonatal medicine: the official journal of the European Association of Perinatal Medicine, the Federation of Asia and Oceania Perinatal Societies, the International Society of Perinatal Obstetricians; Feb 2002; vol. 11 (no. 2); p. 138-139

Publication Date: Feb 2002
Publication Type(s): Case Reports Journal Article
PubMedID: 12375544

Abstract: A rare occurrence of the syndrome of inappropriate antidiuretic hormone secretion is described in a 32-year-old previously healthy nulliparous woman who underwent a Cesarean section for non-progressive labor.

Database: Medline

57. Sheehan syndrome presenting as early post-partum hyponatraemia.

Author(s): Boulanger, E; Pagniez, D; Roueff, S; Binaut, R; Valat, A S; Provost, N; Leroy, R; Codaccioni, X; Dequiedt, P

Source: Nephrology, dialysis, transplantation: official publication of the European Dialysis and Transplant Association - European Renal Association; Nov 1999; vol. 14 (no. 11); p. 2714-2715

Publication Date: Nov 1999
Publication Type(s): Case Reports Journal Article
PubMedID: 10534518

Available at Nephrology, dialysis, transplantation: official publication of the European Dialysis and Transplant Association - European Renal Association - from Oxford Journals - Medicine
Available at Nephrology, dialysis, transplantation: official publication of the European Dialysis and Transplant Association - European Renal Association - from HighWire - Free Full Text
Available at Nephrology, dialysis, transplantation: official publication of the European Dialysis and Transplant Association - European Renal Association - from Unpaywall

Database: Medline

58. Maternal and neonatal hyponatraemia: A comparison of Hartmanns solution with 5% dextrose for the delivery of oxytocin in labour

Author(s): Higgins J.; Gleeson R.; Holohan M.; Cooney C.; Darling M.

Source: European Journal of Obstetrics Gynecology and Reproductive Biology; Sep 1996; vol. 68 (no. 1); p. 47-48

Publication Date: Sep 1996
Publication Type(s): Article
PubMedID: 8886680

Abstract: We performed a randomised controlled trial to compare the effect on neonatal and maternal serum sodium of using oxytocin in Hartmanns solution compared to the standard 5% Dextrose regimen for induction or augmentation in labour. We found significantly decreased maternal and neonatal serum sodium concentrations in the 5% Dextrose group compared to the Hartmanns group.
59. Hyponatraemia and non-electrolyte solutions in labouring primigravida
Author(s): Stratton J.F.; Stronge J.; Boylan P.C.
Source: European Journal of Obstetrics Gynecology and Reproductive Biology; 1995; vol. 59 (no. 2); p. 149-151
Publication Date: 1995
Publication Type(s): Article
PubMedID: 7657008
Abstract: We performed a prospective randomised study on one hundred primigravid women who required oxytocin to augment labour, comparing dextrose infusion with normal saline. After delivery, the 45 patients whose oxytocin was infused in dextrose had significantly lower serum sodium levels in both mother and baby compared to the 48 patients who had their oxytocin administered in normal saline. This was particularly evident in those cases where epidural analgesia was employed.
Database: EMBASE

60. Inappropriate secretion of antidiuretic hormone in Sheehan's syndrome: a rare cause of postpartum hyponatremia.
Author(s): Putterman, C; Almog, Y; Caraco, Y; Gross, D J; Ben-Chetrit, E
Source: American journal of obstetrics and gynecology; Nov 1991; vol. 165 (no. 5); p. 1330-1333
Publication Date: Nov 1991
Publication Type(s): Case Reports Journal Article
PubMedID: 1957856
Abstract: A 27-year-old woman experienced hemorrhagic shock after delivery. One week later she was seen in an obtunded state of consciousness. The results of laboratory evaluation were consistent with the syndrome of inappropriate antidiuretic hormone secretion caused by hypopituitarism. Hydrocortisone rapidly corrected sodium levels. Syndrome of inappropriate secretion of antidiuretic hormone caused by Sheehan's syndrome should be considered in the differential diagnosis of postpartum hyponatremia.
Database: Medline
61. A case of postpartum hypopituitarism (Sheehan's syndrome) associated with severe hyponatremia and congestive heart failure.

**Author(s):** Kageyama, Y; Hirose, S; Terashi, K; Nakayama, S; Komatsuoka, O; Fukuda, H

**Source:** Japanese journal of medicine; Aug 1988; vol. 27 (no. 3); p. 337-341

**Publication Date:** Aug 1988

**Publication Type(s):** Case Reports Journal Article

**PubMedID:** 3264036

Available at [Japanese journal of medicine](https://www.unpaywall.org) from Unpaywall

**Abstract:** A case of a 69-year-old woman with postpartum hypopituitarism (Sheehan's syndrome) associated with congestive heart failure and severe hyponatremia is reported. She developed congestive heart failure after cholecystectomy, and marked improvement was noted by treatment with oxygen, digoxin, furosemide, and dopamine. Two weeks after surgery, she became confused, and hyponatremia, 106 mEq/l, was detected. She was referred to us. Past history revealed postpartum hemorrhage at the age of 34, followed by a failure to lactate, menoschesis, and loss of pubic hair and axillary hair. Hypertonic saline (1.5%) infusion and water restriction increased her serum sodium concentration into the low normal range. Despite hyponatremia, serum vasopressin was not suppressed. Basal levels of pituitary hormones were low, and they did not respond to provocation tests. Marked impairment of water excretion was noted, and plasma vasopressin was not suppressed during a water-loading test. These results suggest that inappropriately increased vasopressin played an important role in impaired water excretion, and this defect could have been responsible for the development of hyponatremia and congestive heart failure in this patient.

**Database:** Medline

62. Postpartum hyponatremia.

**Author(s):** Sidorov, J; Mitnick, P

**Source:** The American journal of medicine; Jul 1987; vol. 83 (no. 1); p. 183-184

**Publication Date:** Jul 1987

**Publication Type(s):** Letter Case Reports

**PubMedID:** 3605171

**Database:** Medline

63. Sheehan's syndrome complicated with hyponatremia--a case report

**Author(s):** Kuo S.W.; Shian L.R.; Jeng C.Y.; Sheen T.Y.; Huang H.W.

**Source:** Taiwan yi xue hui za zhi. Journal of the Formosan Medical Association; Nov 1985; vol. 84 (no. 11); p. 1283-1288

**Publication Date:** Nov 1985

**Publication Type(s):** Article

**PubMedID:** 3879499

**Database:** EMBASE
64. Iatrogenic neonatal and maternal hyponatraemia following oxytocin and aqueous glucose infusion during labour.

**Author(s):** Singhi, S; Chookang, E; Hall, J S; Kalghatgi, S

**Source:** British journal of obstetrics and gynaecology; Apr 1985; vol. 92 (no. 4); p. 356-363

**Publication Date:** Apr 1985

**Publication Type(s):** Journal Article

**PubMedID:** 3986166

**Abstract:** Maternal and umbilical cord serum sodium and osmolality were studied prospectively in 140 deliveries to investigate whether transplacental hyponatraemia, seen following oxytocin infusion during labour, was due to the antidiuretic effect of oxytocin or was secondary to the infusion of aqueous glucose used as a vehicle for oxytocin, or both. Forty-five women received oxytocin in aqueous glucose for induction or augmentation of labour (oxytocin group), 43 received aqueous glucose infusion alone (glucose group) and 52 did not receive any intravenous infusions (control group). Mean cord sodium levels were significantly lower in the oxytocin (131.4, SD 3.6 mmol/l) and glucose groups (132.5, SD 3.2 mmol/l) than in the control group (135.0, SD 3.0 mmol/l). Hyponatraemia (Na less than 130 mmol) was seen in 47% and 30% of the infants in the oxytocin and glucose groups respectively, in contrast to only 5.8% of the infants in the control group. Significant negative linear correlations were seen between serum sodium and the dose of oxytocin (P less than 0.01) and log of the volume of glucose solution infused (P less than 0.001). The hyponatraemic newborn infants had a significantly higher incidence of transient neonatal tachypnea (7/37, 19%) than the normonatraemic infants (2%). Our results strongly suggest that infusion of oxytocin and glucose both cause maternal and transplacental hyponatraemia, even in recommended doses. This should be taken in account while planning a safe dose of oxytocin and glucose for infusion during labour.

**Database:** Medline

65. Maternal fluid overload during labour; transplacental hyponatraemia and risk of transient neonatal tachypnoea in term infants.

**Author(s):** Singhi, S C; Chookang, E

**Source:** Archives of disease in childhood; Dec 1984; vol. 59 (no. 12); p. 1155-1158

**Publication Date:** Dec 1984

**Publication Type(s):** Journal Article

**PubMedID:** 6524946

**Abstract:** Cord serum sodium concentrations in two groups of vaginally delivered, singleton term infants were correlated with the incidence of transient neonatal tachypnoea. Hyponatraemia (cord serum sodium less than 130 mmol/l) was seen in 71 of 180 (39%) infants born to mothers who received an intravenous infusion of aqueous glucose solution during labour (study group) compared with 6 of 103 (6%) infants born to mothers who did not receive any intravenous fluid treatment (controls). The incidence of transient neonatal tachypnoea was 4.5 times higher for hyponatraemic
infants in the study group (11 of 71) than for normonatraemic infants in the same group (3 of 109) and the control group (3 of 97). The difference was not attributable to other perinatal or neonatal characteristics. Our findings suggest an increased risk of transient neonatal tachypnoea in term infants who suffer from transplacental hyponatraemia after their mothers received intrapartum infusion of aqueous glucose solutions.

Database: Medline

66. Hyponatraemia with water intoxication during pregnancy and labour

Author(s): Daggett P.; Shields M.

Source: Journal of Obstetrics and Gynaecology; 1982; vol. 3 (no. 2); p. 98-101

Publication Date: 1982

Abstract: Four patients had a grand mal convulsion following the occurrence of hyponatraemia during pregnancy. In 3, the problem was caused by the haemodilution consequent upon infusion of oxytocin and 5 per cent dextrose solution in labour. In a prospective survey of 30 subjects treated with this regimen, asymptomatic hyponatraemia developed in 3. Hyponatraemia has risks for mother and baby. Limitation of fluid, given by a separate intravenous line, and 4-hourly plasma sodium estimations might eliminate the problem.

Database: EMBASE

67. Iatrogenic hyponatraemia in mother and infant.

Author(s): Burnell, R H; Dahlenburg, G W

Source: The Medical journal of Australia; Sep 1979; vol. 2 (no. 5); p. 254

Publication Date: Sep 1979

Publication Type(s): Case Reports Journal Article

PubMedID: 117290

Database: Medline
<table>
<thead>
<tr>
<th>#</th>
<th>Database</th>
<th>Search term</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Medline</td>
<td>exp HYPONATREMIA/</td>
<td>9664</td>
</tr>
<tr>
<td>2</td>
<td>Medline</td>
<td>(hyponatremia OR hyponatraemia).ti,ab</td>
<td>12435</td>
</tr>
<tr>
<td>3</td>
<td>Medline</td>
<td>(1 OR 2)</td>
<td>15465</td>
</tr>
<tr>
<td>4</td>
<td>Medline</td>
<td>(labor OR labour).ti,ab</td>
<td>107810</td>
</tr>
<tr>
<td>5</td>
<td>Medline</td>
<td>exp &quot;LABOR, OBSTETRIC&quot;/</td>
<td>47348</td>
</tr>
<tr>
<td>6</td>
<td>Medline</td>
<td>exp &quot;OBSTETRIC LABOR COMPLICATIONS&quot;/</td>
<td>74055</td>
</tr>
<tr>
<td>7</td>
<td>Medline</td>
<td>(postpartum OR &quot;post partum&quot; OR postnatal* OR &quot;post natal**&quot;).ti,ab</td>
<td>186176</td>
</tr>
<tr>
<td>8</td>
<td>Medline</td>
<td>exp &quot;POSTPARTUM PERIOD&quot;/</td>
<td>69829</td>
</tr>
<tr>
<td>9</td>
<td>Medline</td>
<td>(4 OR 5 OR 6 OR 7 OR 8)</td>
<td>397066</td>
</tr>
<tr>
<td>10</td>
<td>Medline</td>
<td>(3 AND 9)</td>
<td>200</td>
</tr>
<tr>
<td>14</td>
<td>EMBASE</td>
<td>(labor OR labour).ti,ab</td>
<td>131594</td>
</tr>
<tr>
<td>15</td>
<td>EMBASE</td>
<td>exp &quot;LABOR, OBSTETRIC&quot;/</td>
<td>36686</td>
</tr>
<tr>
<td>16</td>
<td>EMBASE</td>
<td>exp &quot;OBSTETRIC LABOR COMPLICATIONS&quot;/</td>
<td>205407</td>
</tr>
<tr>
<td>17</td>
<td>EMBASE</td>
<td>(postpartum OR &quot;post partum&quot; OR postnatal* OR &quot;post natal**&quot;).ti,ab</td>
<td>239120</td>
</tr>
<tr>
<td>18</td>
<td>EMBASE</td>
<td>exp &quot;POSTPARTUM PERIOD&quot;/</td>
<td>70436</td>
</tr>
<tr>
<td>19</td>
<td>EMBASE</td>
<td>(14 OR 15 OR 16 OR 17 OR 18)</td>
<td>556763</td>
</tr>
<tr>
<td>20</td>
<td>EMBASE</td>
<td>(hyponatremia OR</td>
<td>7135</td>
</tr>
<tr>
<td>Step</td>
<td>Database</td>
<td>Query</td>
<td>Results</td>
</tr>
<tr>
<td>------</td>
<td>----------</td>
<td>----------------------------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>21</td>
<td>EMBASE</td>
<td>&quot;HYPONATREMIA/ OR &quot;HYPOVOLEMIC HYPONATREMIA&quot;/ OR *POTOMANIA/ OR *HYPONATRIAEMIA/</td>
<td>9262</td>
</tr>
<tr>
<td>22</td>
<td>EMBASE</td>
<td>(20 OR 21)</td>
<td>9707</td>
</tr>
<tr>
<td>23</td>
<td>EMBASE</td>
<td>(19 AND 22)</td>
<td>184</td>
</tr>
<tr>
<td>24</td>
<td>CINAHL</td>
<td>exp HYPONATREMIA/</td>
<td>2845</td>
</tr>
<tr>
<td>25</td>
<td>CINAHL</td>
<td>(hyponatremia OR hyponatraemia).ti,ab</td>
<td>3013</td>
</tr>
<tr>
<td>26</td>
<td>CINAHL</td>
<td>(24 OR 25)</td>
<td>4031</td>
</tr>
<tr>
<td>27</td>
<td>CINAHL</td>
<td>(labor OR labour).ti,ab</td>
<td>39038</td>
</tr>
<tr>
<td>28</td>
<td>CINAHL</td>
<td>(postpartum OR &quot;post partum&quot; OR postnatal* OR &quot;post natal**).ti,ab</td>
<td>43693</td>
</tr>
<tr>
<td>29</td>
<td>CINAHL</td>
<td>exp &quot;LABOR COMPLICATIONS&quot;/</td>
<td>12885</td>
</tr>
<tr>
<td>30</td>
<td>CINAHL</td>
<td>exp LABOR/</td>
<td>14533</td>
</tr>
<tr>
<td>31</td>
<td>CINAHL</td>
<td>exp &quot;POSTNATAL PERIOD&quot;/</td>
<td>14940</td>
</tr>
<tr>
<td>32</td>
<td>CINAHL</td>
<td>(27 OR 28 OR 29 OR 30 OR 31)</td>
<td>98618</td>
</tr>
<tr>
<td>33</td>
<td>CINAHL</td>
<td>(26 AND 32)</td>
<td>58</td>
</tr>
</tbody>
</table>