Introduction

Diabetes insipidus (DI), a rare occurrence in pregnancy, has an incidence, varying from 1-6 per 300,000 pregnancies (1-8). There are three different types of pregnancy-associated DI, central, nephrogenic and a transient condition called, gestational DI (GDI), which is believed to be associated with increased activity of vasopressinase (5). Occurring usually in the third trimester of pregnancy, the etiology of transient GDI is probably excessive activity of placental vasopressinase, an enzyme synthesized by the placenta and degraded by the maternal liver. Vasopressinase can degrade arginine vasopresine (AVP), but not the synthetic analogue, 1-deamino-8D-arginine vasopressin (dDAVP); AVP level remains in the normal range during pregnancy, but its production rate increases to compensate for the escalating degradation rate and to maintain sufficient antidiuretic activity.

Here we report a case of 33 year-old woman, pregnant with twins and diagnosed with transient GDI. Because this syndrome is rare, especially in a twin pregnancy, there is often confusion about its cause and the appropriate management.

Case report

A 33-year-old woman in her 36th week of a monochorionic diamniotic twin pregnancy was admitted in November 2009 to the endocrine ward of the Emamreza Teaching General Hospital of Tabriz University (Medi-cal Sciences), Tabriz, Iran; she had a 2 month history of polyuria and excessive thirst. She had had regular monthly obstetric visits and the course of her pregnancy had been uneventful until 2 month ago, when she noted excessive urination. She was a nulliparous gravid 1 woman, with no remarkable past medical or family history, other than a 7 year history of infertility, despite which she had conceived without any intervention. She was on prenatal supplements of iron, folic acid and calcium carbonate...
plus vitamin D. On the day of admission she was alert and oriented. Examination revealed blood pressure of 110/60 mmHg, pulse rate of 78 beats/min, respiratory rate of 15/min, temperature of 36.4°C and body mass index of 33.3 kg/m². Her skin turgor was normal and no heart murmur or abnormal respiratory sounds were audible. The abdomen was distended due to her enlarged uterus. Laboratory evaluation revealed urine volume was 7000 cc and creatinine 950 mg/24h. Urine specific gravity was 1005 and 1004 on 2 occasions and urine and plasma osmolalities were 175 and 293 mosmol/L respectively (Table 1).

Due to fasting blood glucose of 110 mg/dL, a 100 gram oral glucose challenge test was performed and the results were normal. There was no significant hemococoncentration in our patient. She had no significant abnormality on liver ultrasound. Pelvic ultrasound showed two live fetuses with adequate amniotic fluid, male sex, monochorionic and diamniotic, without any major congenital anomaly. Pituitary MRI could not be obtained due to the patient being concerned regarding the exposure of the fetuses to the contrast material. Because of the worsening clinical condition of the patient, and considering the results of urine relative hyposmolality and serum hypertonicity, the water deprivation test was not performed and intranasal dDAVP was administered with close monitoring of fluid balance, weight, pulse rate, blood pressure and frequent measuring of the serum sodium, and serum and urine osmolalities. Recovery was uneventful and she responded appropriately to desmopressin therapy. Her polyuria and polydipsia reduced and urine output dropped to 2500 mL/day, serum sodium to 139 mmol/L and patient was discharged and scheduled for weekly follow ups. Two weeks later she admitted to another hospital for cesarean section and delivered two healthy male infants with 1 minute Apgar scores of 9 and 8 and birth weights of 2590 and 2560 grams. On the second postnatal day, progressive jaundice developed in both infants, which was treated by phototherapy.

During pregnancy, and in the absence of glycosuria, hypokalemia or hypercalcemia, DI can be established if a high output of dilute urine, intense thirst, and hypernatremia (11). Hanson and et al. reported a patient with severe oligohydramnios that resolved after treatment of DI (12). If suspected, the diagnosis of DI should be confirmed by performing a water deprivation test, in which after an overnight fast, the patient is asked to withhold water intake until 3% of her body weight is lost or urine osmolality shows no increase in three successive hourly specimens; In women who have DI, urine osmolality remains unchanged, whereas plasma osmolality increases significantly. Because of the risks that are associated with dehydration, in severe cases with high urine output this test is best performed by an endocrinologist (9).

During pregnancy, and in the absence of glycosuria, hypokalemia or hypercalcemia, DI can be established if a patient with a syndrome of polyuria-polydipsia has a serum osmolality > 285 mOsm/kg. There is a direct relationship between serum vasopressinase activity and the weight of the placenta, explaining why in multiple gestations an increase in vasopressinase activity is encountered, as well as the appearance of DI in the 3rd trimester (8). Gestational DI is a transient syndrome and may be associated with acute fatty liver of pregnancy and preeclampsia of posterior pituitary bright spot was visible in the Sagittal Ti weighted unenhanced images of the pituitary fossa.

### Discussion

In a normal pregnancy during the first trimester there are many hemodynamic, renal, and electrolyte changes, which reach their peak during the second trimester, remain relatively stable during the third trimester, and rapidly reverse after delivery. Usually, the plasma osmolality in pregnancy falls to a new set point of about 270 mOsm/kg, the plasma sodium concentration falls by approximately 5 to 10 mEq/L and serum sodium is almost always less than 140 mEq/L in normal pregnancy (1, 2). Arginine vasopressin (AVP) is a nonapeptide that is secreted by the axonal terminals of neurosecretory neurons located in the supraoptic and paraventricular nuclei of the hypothalamus. A rare disease in pregnancy (9, 10), DI presents with neurologic symptoms in a patient near term with a high output of dilute urine, intense thirst, and hypernatremia (11).

### Table 1. Laboratory findings

<table>
<thead>
<tr>
<th>Blood</th>
<th>Admission day</th>
<th>Day 1 After treatment</th>
<th>Day 7 After treatment</th>
<th>Day 10 Post partum</th>
<th>Day 40 Post partum</th>
<th>Day 14 After drug cessation</th>
</tr>
</thead>
<tbody>
<tr>
<td>FBS (mg/dL)</td>
<td>110</td>
<td>86</td>
<td>-</td>
<td>88</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hemoglobin (gm/dL)</td>
<td>11.8</td>
<td>-</td>
<td>-</td>
<td>12</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hematocrit (%)</td>
<td>34.8</td>
<td>-</td>
<td>-</td>
<td>35</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Na (mEq/L)</td>
<td>143</td>
<td>140</td>
<td>139</td>
<td>140</td>
<td>138</td>
<td>139</td>
</tr>
<tr>
<td>K (mEq/L)</td>
<td>4.2</td>
<td>4</td>
<td>-</td>
<td>4.2</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Creatinine (mg/dL)</td>
<td>0.8</td>
<td>-</td>
<td>0.8</td>
<td>0.9</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Osmolality (mosmol/kg)</td>
<td>293</td>
<td>284</td>
<td>-</td>
<td>284</td>
<td>280</td>
<td>284</td>
</tr>
<tr>
<td>Urine Volume (CC)</td>
<td>7000</td>
<td>2500</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Osmolality (mosmol/kg)</td>
<td>175</td>
<td>635</td>
<td>700</td>
<td>730</td>
<td>700</td>
<td>850</td>
</tr>
</tbody>
</table>
Transient diabetes in a twin pregnancy: a case report

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None declared.

Conflict of interest
None declared.

References


