

Pre-Eclampsia: A Co-Incidence Or A Manifestation Of Diabetes Insipidus?

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Citation

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Abstract

We report a case of Diabetes Insipidus developing in a preeclamptic pregnant patient.

INTRODUCTION

Diabetes Insipidus (DI) is a disease with inability of the kidneys to concentrate urine. It manifests itself as massive polyuria, nocturia, low urinary specific gravity, and hypernatremia. This problem is related to antidiuretic hormone (ADH), a posterior pituitary hormone responsible for the osmoregulation in the body. It is either due to relative or an absolute deficiency of the hormone (Cranial DI) or to a lack of renal responsiveness to the circulating ADH (Nephrogenic DI).^{1,2} The third type is gestational DI, the exact cause of which is unknown.

CASE REPORT

This is a report of a case of a 30 years old primary gravida with Cranial Diabetes Insipidus which was diagnosed at the age of 17. Patient was admitted at 9 weeks gestation with a blood pressure of 100/60. She was started on Desmopressin 700 microgram in four divided doses and was planned to be seen in the joint clinic every four weeks where her serum and urine electrolytes were checked. Throughout the pregnancy all her serum and urine U&E's and osmolalities remained normal. Her glucose tolerance test (GTT) at 28 weeks was normal. From 25 weeks she developed high blood pressure with mild proteinuria but her 24 hours urine protein remained below 300 milligrams. She was started on methyldopa. Ultrasound scan showed normal growth, liquor and end-diastolic flow. She was admitted with abdominal pain and a blood pressure of 160/94, at 34 weeks when CTG became abnormal. She had an emergency caesarean section and delivered a baby who had hypospadias. Baby later developed hyaline membrane disease and required respiratory support.

DISCUSSION

Diabetes insipidus is rare in pregnancy though pregnancy itself can worsen the condition. The incidence varies from 2-6/100,000 pregnancies.³ Diabetes insipidus normally manifests in third trimester and is a rapidly progressing condition. However symptoms usually resolve within four week postpartum.

The aetiology is most likely due to increased vasopressinase activity produced by the placenta which has been estimated to increase from 40 folds by mid to 50 fold by late pregnancy resulting in four times increased metabolic clearance of vasopressin (MCR).⁴ Also the activity of vasopressinase is proportional to the weight of the placenta.⁵ Therefore DI is more likely in multiple pregnancies due to bigger placenta. Theoretically, vasopressinase should disappear after the removal of placenta but it has been detected until 4 to 6 weeks postpartum.⁴ It may be the reason that DI can manifest itself during post-partum in the absence of Sheehan syndrome.

Polyuria in Gestational DI may be due to the following three factors. Firstly biochemical properties of vasopressinase, a cystine aminopeptidase that breaks the bond between the 1-cysteine and 2-tyrosine of vasopressin neutralizing its antidiuretic activity of the molecule. Secondly, increased production of renal prostaglandin has been postulated to have an inhibitory effect of vasopressin on the renal tubules, leading to high urine output.⁶ Thirdly small reserve of arginine vasopressin (AVP) or increased hepatic and renal clearance of vasopressin^{7,8} could be a contributing factor for high volume of urine.

The association of pre-eclampsia and diabetes insipidus may

seem confusing. Among the cases reported, ten developed pre-eclampsia, two developed HELLP (haemolysis, elevated liver enzymes and low platelets), one HELLP and DIC (Disseminated intravascular coagulopathy). It has been proposed that high levels of vasopressinase can result in high AVP degradation products which could retain pressor activity⁹. However, AVP degradation products emerged by the action of vasopressinase have not shown any significant role in developing pre-eclampsia.¹⁰

Diabetes insipidus can be diagnosed if serum osmolality is rising while urine osmolality is less than 300 mOsm/kg and inappropriately massive urinary flow. If the patient has normal serum osmolality but has polyurea and urine osmolality less than 300 mOsm/kg, a water deprivation test could be the next step but it is not recommended in pregnancy due to the risk of dehydration¹¹. However the test has its value in postpartum period. Vasopressin can be tried intramuscularly to differentiate between vasopressin sensitive and vasopressin resistant cases. In case of vasopressin resistance, intranasal DDAP (1-desamino-8-D-arginine vasopressin) can be tried as being resistant to the effect of vasopressinase¹².

To provide best antenatal care patient with DI should be seen in joint clinics with both obstetrician and endocrinologist. To exclude Diabetes mellitus urine should be tested for glucose and also GTT should be arranged at 28 weeks. Patient would need regular checks on her serum U&Es, osmolality and creatinine along with the urine osmolality. Since the condition can be complicated by pre-eclampsia and HELLP, patients should be investigated for pregnancy induced hypertension as well. Though the exact mechanism of developing pre-eclampsia is not known yet, a vigilant eye must be kept on blood pressure especially after 30 weeks of pregnancy.

There is very limited information about the teratogenic effect of desmopressin during early pregnancy. In our case report, patient remained on desmopressin from the very beginning of her pregnancy unlike majority of the reported cases where patients were treated during third trimester. On delivery baby was noted to have hypospadias. Further research is required in this area to see if this medicine has any real teratogenic potential especially if started during first trimester.

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