

DIABETES INSIPIDUS DURING PREGNANCY

(A Case Report)

by

CHAMANLAL MEHTA, M.B.B.S., F.R.F.P.S., F.C.P.S.,
Bombay.

Diabetes Insipidus is a rare condition and more so arising during pregnancy. DeLee and Greenhill found only 3 amongst 50,000 cases at the Boston Lying-in Hospital. J. S. Fairbairn also thought it to be a rare complication of pregnancy. Incidence has been so low that text books in Obstetrics published in U.K. and U.S.A. from 1933 to 1953 make no mention of this complication. Modern text books give small notes on the subject, while books on general medicine devote a page or so. References have been found in books of special interest like Antenatal and Postnatal Care (1942), Obesity and Leanness (1940), Toxaemia of Pregnancy (1952). Searching the volumes of American Journal of Obstetrics & Gynaecology for a period of 22 years (1929-1951) it is only in 1931, 1941, 1944 and 1946 that some references on the subject are available and that too once in each year. In the Journal of Obstetrics and Gynaecology of British Empire, six references are found during those years. It is for such rare occurrence of Diabetes Insipidus complicating pregnancy that we justify reporting our case.

Case Report

Mrs. C.S.L., 29 years old, wife of a doctor, and Nagar Brahmin by caste. She was

married four years ago, was a primipara and third gravida. Her obstetric history was of two abortions, the first in 1954 at 1 month 8 days and the second in 1956 at 1 month 15 days. Her last menstrual period was on 28th July 1957.

On 27th December, 1957, at the fifth month of pregnancy, the patient started, at 2 p.m., having frequency of micturition, at first every half an hour and in good quantity. Later, the frequency diminished at night after she had a tablet of Dial when she passed urine only twice. The next day till noon she was better. Then the frequency reappeared with total output of urine during the day, 4800 c.c. At night she was restored back with a tablet of Dial. This continued for four days.

On 1-1-58, the patient had to pass urine at intervals of every fifteen minutes and she had to be in the bathroom for almost a similar time. Signs of dehydration showed, with rapid pulse, giddiness and nervousness. At this stage a doctor was consulted at Rajkot with no particular effect. The quantity of urine passed per day was 1980 to 3840 c.c.

Another doctor prescribed injections of pituitrin, five units intra-muscularly per day, and stamped her as a case of diabetes insipidus. The patient did not tolerate pituitrin. She felt severe pain in abdomen, frequent desire to pass stools and sometimes she became semiconscious and turned pale white. In spite of this, injections were continued for six days. On two of these days, two injections per day were given thus totalling up to forty units in all. Her condition did not improve.

On 17-1-58, a third physician was brought in. He further advised bigger

dose of pituitrin and X-ray of the skull. Within four days forty units were administered. The reactions were bad as before yet her urinary disturbance showed gradual improvement. The daily output of urine dropped to 2280 c.c. This continued till the end of January. X-Ray of skull showed no pathological lesion.

On 17-2-58, she consulted us in Bombay. She was progressing well and was taking usual haematinics. Her urine was free from albumin and sugar. The blood pressure reading was 138/80 and the weight was 146½ pounds. Her condition was otherwise satisfactory. Her due date was in the first week of May.

On 24-2-58, she was admitted into the hospital for observation and further investigations. Records of fluid intake and urinary output were kept for 48 hours. The output varied from 2160 to 2910 per day. The specific gravity of urine was 1006.

On 27-2-58, the urine concentration test was performed. The previous evening, fluids were restricted to 200 c.c. only, consisting of water and liquid dal. The latter contained fair quantities of protein. A sample of urine collected at 8 a.m. on the 27th had specific gravity of 1006. The 11 o'clock specimen showed no change in the specific gravity of urine. Absolutely dry lunch and supper were given during the day. Even water was not allowed. Urine collected at 7 p.m. showed the specific gravity of 1013. The next day at 6 a.m. the specific gravity rose to 1015, and at 11 a.m., to 1016. The urinary output was thus far, 465 c.c. After two days of further observation the patient was discharged from the hospital.

Till 31st of March, the patient progressed satisfactorily when she was readmitted for a Saline Infusion test. On admission, there was no frequency of micturition nor excessive quantity of urine. The weight of the patient was 150 pounds and the rest of the examinations was normal. She passed urine thrice during the night and the output of urine was 1530 c.c. At 9 a.m. on 1st of April, 500 c.c. of hypertonic saline, 2.5% specially prepared by Messrs. Cipla Laboratories, was administered intravenously in 45 minutes. She took it quite well. By noon the thirst was extreme and 840 c.c. of water was consumed during the next four

hours. On 2nd of April, there was no oedema on legs or the abdomen. Upto 8 a.m., since after the saline infusion, the intake was 2760 c.c. Total quantity of urine passed was 3765 c.c. The weight of the patient was 148 pounds and her blood pressure was 180/78. Largactil 12½ mgm. was given at 9 a.m. and 6 p.m. Within the next two days, both the intake and the output diminished. The latter was 1230 c.c.

A continuous and satisfactory progress was maintained till 25th of April, when the patient confined naturally of a bonny boy of 7 pounds. The episiotomy wound got infected during the puerperium and it had to be restitched. The patient was discharged on 29-5-58. On 16th June, almost two months after the confinement, the patient was doing well.

Comments

Diabetes Insipidus is characterised by polyuria and polydipsia. It is a disturbance of water balance. Enormous quantities of very dilute but otherwise normal urine is passed and is associated with tremendous thirst. It might appear at any time during pregnancy and disappear or persist after delivery (DeLee 9th Ed.). It might also disappear during later stages of pregnancy (Heart, Bruisman). It may cause no other symptoms except polyuria or it might disturb sleep, cause anxiety, loss of weight and strength and might cause emaciation. It may make her bedridden (Price med. 9th Ed.).

Majority of the cases so far reported were already suffering from Diabetes Insipidus when pregnancy occurred. But there are a few cases on record where Diabetes Insipidus appeared during pregnancy. When it appears during pregnancy it is likely to disappear after delivery or during the same pregnancy. If pregnancy occurred in those who were

already suffering from the disease, they suffered more and the disease took a severe form; the patients even developed pre-eclampsia (Berkley, Bonny and McCleod).

F. J. Brown, Rayoulds and Robson found pregnancy continuing normally to term. There were no ill-effects on the labour and the child; there was, therefore, no necessity to terminate pregnancy; while Fisher, Magoun, Ranson, Melvyn Berland and G. Maranon had their cases develop atony of the uterus and dystocia. They needed operative interference and babies were still-born. When the disease was controlled by administration of injection of posterior pituitary extract, the woman went to full-term and delivered normally. G. Maranon reported a case of a woman suffering from Diabetes Insipidus. She conceived twice and aborted. When she became pregnant the third time, she was treated by injection of posterior pituitary extract. She kept well, went to full-term and delivered normally of a healthy child. During her fourth pregnancy pituitary injections were not given as the drug was not available. She developed atony of the uterus, operative interference was needed and she had a still-born child.

Diabetes Insipidus is due to a destructive lesion in the posterior lobe of the pituitary gland or of the adjacent part of the hypothalamus, the lesion being in the Pars Nervosa. Yet in a good majority, the actual etiological factor is not detected. It may be trauma, vascular lesion, syphilis, T.B. meningitis, primary or metastatic growth, or pituitary neoplasm involving posterior lobe. It

might follow shock via hypothalamic mechanism (Price). Polyuria and polydypsia occur only if the lesion is confined to the posterior lobe and if the anterior lobe is functionally active. The posterior lobe produces anti-diuretic hormone while the anterior lobe produces diuretic hormone. Between these two the water balance of the body is maintained. If the posterior pituitary is injured anterior lobe gets a free play and polyuria develops. Total hypophysectomy is not followed by Diabetes Insipidus (Hugo R. Romy). Interesting experiments on cats have been summarised as under (Obst. Gynae. Survey):

- (1) Removal of posterior pituitary lobe produces Diabetes Insipidus.
- (2) Thyroidectomy prevents experimental Diabetes Insipidus.
- (3) Necrosis of the anterior lobe and subsequent atrophy of thyroid would prevent Diabetes Insipidus.
- (4) Diabetes Insipidus can be connected with lesions of posterior lobe and of the adjacent hypothalamus.
- (5) Polyuria resulting from ablation of posterior lobe is less enduring than that following interference with hypothalamus.
- (6) Complete removal of whole pituitary results in transient polyuria. Persistent polyuria experimentally produced is relieved by the removal of anterior lobe of pituitary.
- (7) In P.P.H. shock, anterior lobe is usually damaged and Shee-

han's Syndrome develops. In some cases Diabetes Insipidus has occurred. How this happened is not clearly understood. Posterior lobe may be affected by secondary inflammation spreading to it or the shock may cause partial necrosis of anterior as well as posterior lobes.

Diabetes Insipidus developed in a woman during the 34th week of her pregnancy and disappeared after a premature delivery. The complication had followed upon a heavy fall of the patient injuring her cheek but not losing consciousness. Examination showed no pathological lesion.

(*Jour. Obst. & Gyn. Br. Emp.*).

Water-electrolytes balance (sodium, chlorides and potassium) is controlled by hormones primarily from posterior lobe of pituitary and cortex of adrenal gland. Nerve stimulants, such as fear, can cause the release of anti-diuretic hormone from posterior pituitary and adrenal gland and produce pre-eclampsia in a pregnant woman having Diabetes Insipidus (Dickman). Fisher, Morgoun and Robson's experiments on cats supported the theory that pituitary oxytocic hormone was necessary for normal parturition and that interruption of hypothalamic-hypophysial tract produced deficiency of pituitary oxytocic hormone and caused atony of the uterus and in efficient labour. Editor of the Year Book in Obst. & Gynae., 1938, commenting on a paper on Dystosia in Diabetes Insipidus observed that the posterior pituitary is a continuation of the brain and the anterior lobe is derived from the

upper respiratory tract, but both are under the domination of basal ganglia and, therefore, of the higher brain. Mental emotional states thus are easily transmitted to pituitary body.

There are a number of complications in pregnancy in which polyuria may occur. Proper diagnosis therefore is required.

1. Hysteria may be differentiated by its tendency to polyuria by being more marked during the day and patient may sleep well through the night; while in Diabetes Insipidus it is more marked during the night. Hysterical patients usually remain in good health in spite of polyuria and polydypsia.
2. Familial hypersensitiveness to caffeine. If excessive tea or coffee is drunk polyuria results.
3. Hyperglycaemia and glycosuria can be easily diagnosed.
4. Chronic Nephritis—urine may be voluminous and of constantly low specific gravity; but it contains albumen and renal casts.
5. Pituitary and para-pituitary tumours—Radiography of the skull. Examination of optic disc and of visual fields should help to diagnose it.
6. Syphilis—Wasserman test will exclude tertiary syphilis.
7. Diabetes Insipidus—diagnosis of this can be helped by urine concentration and saline infusion tests. History of the patient also will be useful.

The only treatment of Diabetes Insipidus is replacement therapy.

Pitressin tannate in oil 5 mgm. in 1 c.c. intramuscularly will control polyuria and polydypsia for 24 to 48 hours. This is preferred to aqueous preparation which is given in 10 to 20 units in 1 c.c. two or three times a day. Sometimes, pitressin injections are given frequently during the day in doses of 0.1 to 1.0 c.c. Pitressin powder 50 mgm. insufflated intranasally will also have a similar effect. When larger doses are given, pallor, headache, intestinal cramps, precipitate bowel action may complicate treatment. The case under report also suffered from those complications. In her case even uterine cramps were felt. It is better that pregnant women, with hypersensitivity to pituitrin and with coronary insufficiency, are given pitressin tannate in oil intramuscularly once in 24 hours. Dietary measures should also be adopted. A diet low in salt and containing 1 gm. of protein per kilogram of body weight with sufficient calories to maintain weight should be given.

Important features of the case under report were that she was a healthy pregnant woman. She had already two abortions. She therefore had the fear and anxiety lest she aborted again. She developed polyuria and polydypsia all of a sudden during her 5th month. She was troubled more during the day than at night. Symptoms were severe enough to make her feel weak, dehydrated, giddy and nervous. Her pulse became fast and voice low. Injection of posterior pituitary extract, 5 units once a day, did not improve her but she proved to be sensitive even to that dose. The dose was then raised

to 10 units once a day. She had severe reactions and she could not take more than 4 injections. There was no immediate effect but gradually she improved. Polyuria did not recur during the rest of her pregnancy. Urine concentration and saline infusion tests performed during her 7th month did not show presence of Diabetes Insipidus. She went to full-term under careful antenatal care and confined normally of a good healthy living child. It was, therefore, concluded that Diabetes Insipidus in her case was due to anxiety and fear and was thus psychological. When her condition was checked up twice at interval of a month, each time she was found to be quite healthy and happy with her child.

References

1. Alex W. Spain, Frank Geoghegan: *J. Obst. & Gyn. Br. Emp.*; LII, 223, 1946.
2. Berkley, Bonney and McLeod: *Abnormal Obst.*; 111, 1938.
3. Brown F. J.: *Antenatal & Postnatal Care*; 4th Ed., 452, 1942.
4. DeCastillo: *Am. J. Obst. & Gyn.*; 47, 139, 1944.
5. DeLee and Greenhill: *Principle and Practice, Obst. & Gyn.*; 9th Ed., 459, 1947.
6. Dieckmann: *Toxaemia of Pregnancy*; 2nd Ed., 549, 1952.
7. Fairbairn J. S.: *Midwifery & Diseases of Women*; 164, 1921.
8. Fisher, Magoun and Ranson: *Am. J. Obst. & Gyn.*; 36, 1, 1938.
9. Francis S. Nash: *Am. J. Obst. & Gyn.*; 52, 863, 1946.
10. Hart Breitman: *Am. J. Obst. & Gyn.*; 41, 527, 1941.

11. Hugh C. McLaren and MacLeod: *J. Obst. & Gyn. Br. Emp.*; XLIX, 51, 1942.
12. Hugo R. Rony: *Obesity & Leanness*; 96 and 331, 1940.
13. Klaflein E.: *J. Obst. & Gyn. Br. Emp.*; XXXIV, 443.
14. Maranion G.: *Br. Med. J.*; 2, 769, 1947.
15. Melvyn Berlind: *Year Book, Obst. & Gyn.*; 151, 1948.
16. *Merk's Manual*; 8th Ed., 386.
17. Mironou P.: *J. Obst. & Gyn. Br. Emp.*; 57, 1007, 1950.
18. Price: *Text Book of Practice of Med.*; 9th Ed., 489.
19. Taylor A. M.: *Obst. & Gyn. Survey*; 11, 508, 1956.
20. Tiliakos M. and Doxiades T.: *Obst. & Gyn. Survey*; 11, 511, 1956.
21. Verdenil Casalto: *J. Obst. & Gyn. Br. Emp.*; XLV, 729, 1938.
22. Williams R. H. and Henry C.: *J. Obst. & Gyn. Br. Emp.*; 55, 370, 1948.