

Pregnancy in Patients on Chronic Ambulatory Peritoneal Dialysis (CAPD)

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ABSTRACT

Peritoneal dialysis consists of an exchange between a liquid, the dialysate, and the patient's blood through the peritoneum. Pregnancy in women with End-Stage Renal Disease (ESRD) treated with peritoneal dialysis is very rare and at high maternal-fetal risk. This markedly reduced fertility and fetal loss in dialysis patients is not well understood. This would appear to be due to the consequences of metabolic and endocrine abnormalities resulting in decreased ovulation and a hostile intrauterine environment. Pregnancy in hemodialysis patients is therefore a valuable pregnancy.

Keywords: Renal disease; Dialysis; Pregnancy

INTRODUCTION

Peritoneal dialysis consists of an exchange between a liquid, the dialysate, and the patient's blood through the peritoneum. Pregnancy in women with End-Stage Renal Disease (ESRD) treated with peritoneal dialysis is very rare and at high maternal-fetal risk. This markedly reduced fertility and fetal loss in dialysis patients is not well understood. This would appear to be due to the consequences of metabolic and endocrine abnormalities resulting in decreased ovulation and a hostile intrauterine environment. Pregnancy in hemodialysis patients is therefore a valuable pregnancy. It is also a high-risk pregnancy involving renal prognosis and therefore reduced blood pressure control with a risk of placental insufficiency leading to preeclampsia, premature delivery and an extremely low live birth rate. Despite therapeutic progress and major advances in the management of these patients and their vital prognosis, there are no guidelines for the treatment or management of these patients. Close management and rigorous multidisciplinary follow-up involving the nephrologist and the obstetrician are therefore essential to limit complications, hence the importance of early management and early detection of those pregnancies.

OBSERVATION

We report the case of a patient undergoing prenatal consultation in the high-risk pregnancy department of the Souissi maternity hospital in January 2019, from the diagnosis of pregnancy at 13

weeks of amenorrhea until her delivery. A therapeutic termination of pregnancy was proposed but the patient wished to continue the pregnancy. She is a 36-year-old woman who has been undergoing treatment for diabetic nephropathy since 2014, reached the stage of end-stage chronic renal failure in 2017 and is receiving 2 chronic ambulatory peritoneal dialysis with 2 sessions per week.

Patient has been oligo-anuric for 3 months. The patient also has bilateral blindness and chronic arterial hypertension under treatment (alpha methyl dopa). The patient was put on enoxaparin for thromboembolic prophylaxis, erythropoietin to prevent anemia, folic acid and alfa calcidol. Hemoglobin ranged between 6.9 and 9.0 g/dL. She also benefited from 3 per dialysis transfusions during the pregnancy. She was followed up rigorously with multi-disciplinary management and meticulous clinical and preclinical monitoring. The patient's initial creatinine level was 133 mg/L and her clearance was 5.34 ml/min/1.72m². Her peritoneal dialysis regime comprised an 8 hours cycle with four 1.5L exchanges of glucose solutions. We added an extra session per week as soon as her pregnancy was diagnosed. Urea levels varied from 0.82 to 1,48 g/L We also noticed that the high levels of urea was correlated to the metabolic disorders such as high blood pressure and pre-eclampsia (Figure 1).

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Her BP remained stable and no problems were reported. The patient and her new born were declared discharged at 7 days postpartum after a post-dialysis and neonatal check-up.

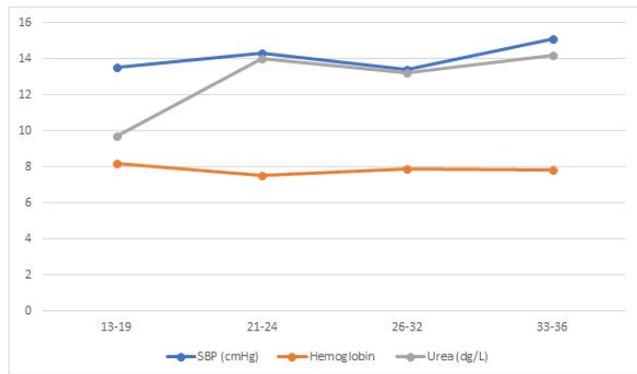


Figure 1: Monitoring of the main parameters during pregnancy (SBP: systolic blood pressure).

As shown in Figure 1, urea levels are responsible for changes in blood pressure. The higher the urea level, the higher the blood pressure is. This highlights the role of urea in hemodynamic fluctuations and in particular in the occurrence of hypertension and even pre-eclampsia.

DISCUSSION

Conception and pregnancy

There are few data on the frequency of pregnancy in dialysis patients, making the estimation of its incidence uncertain [1]. In 1978, the European Dialysis and Transplant Registry reported pregnancies in 0.9% of 13 000 women between the ages of 15 and 44 followed by the association [2]. The success rate of pregnancies in hemodialysis patients in the EDTA report was 23% and in the report of Roxe and Parker 19.2% [3,4]. The US Registry for Pregnancy in Dialysis Patients (RPDP) separates patients on hemodialysis from patients on DP and noted that conception occurs in DP less than half the rate of its frequency in hemodialysis patients. There are less than 100 published cases of pregnancies in patients on CAPD.

Outcome of pregnancy

The success rate of pregnancies in peritoneal dialysis is even lower and less information is available. In the medical literature, when pregnancy occurs, the successful outcome of it is difficult to establish as seen [5].

Capd patients care

Existing data are incomplete to be able to determine guidelines to optimize the prognosis of pregnant dialysis patients. Decisions should therefore be made on a case-by-case basis after multi-disciplinary consent. In our case, the patient presented an impaired renal function with oligo-anuria, which put her at risk of developing various hydro-electrolytic and metabolic disorders with in particular an accumulation of nitrogenous waste products during pregnancy. Nevertheless, the patient progressed to term without any particular problem thanks to the

optimization of its nephrological management. Early diagnosis is an important factor in the prognosis of these patients [6].

Maternal complications

Peritoneal dialysis allows continuous dialysis with better control of urea levels and fewer hemodynamic variations that can affect utero-placental flow, and therefore fewer fluctuations in blood pressure. In women who begin dialysis after conception, about 70% survive when delivery is carried to term and about 55% for those who deliver before term. Our patient was already beneficiating of CADP before the conception, which is very rare to report. It will be necessary to avoid as much as possible falls in blood pressure during the sessions which are highly detrimental to the fetus, and monitor the frequent occurrence of uterine contractions at the end of the second and third session quarters [7]. Okundaye et al found 79% pregnancy induced hypertension (PIH), with less use of antihypertensive treatment and a good response to the increase in HD time. Optimal blood pressure control requires an accurate assessment of the dry weight, an estimate that remains mostly clinical, aided by the knowledge of the "ideal" physiological weight gain during pregnancy which is 1 to 1.5 kg in the first quarter and 500 g/week in the second and third quarters. However, the research concerning DP is very poor in this regard and seems to follow the same pattern. In pregnant women, the pregnant uterus may have insufficient space and peritoneal surface area for exchange. This is usually resolved by reducing the volume of exchanges and increasing their frequency. Its dosage should be increased due to the higher need for in red blood cell production. Our patient received EPO only 2 times and presented a resistance, hence the need for transfusion. The use or increase early dosage of EPO helps to reduce the frequency of 77% to 26% transfusion [8]. We compared the variation of our case parameters with those of studies made in patients on chronic hemodialysis (Table 1):

Study	Hemoglobin g/dL	Hypertension
Chao [28]	7.2	72.2%
Haase [29]	8.9	40%
Chou [30]	9.9	57.4%
Doukkali [31]	8	41.66%
Our case	7.1-9.0	Chronic / Preeclampsia

Table 1: Maternal complications.

Deliverance hemorrhage is also a fairly commonly described complication due to the continuous anticoagulation of these patients in order to avoid thromboembolic disorders, but its incidence remains low. Our patient had a directed delivery and presented a good safety globe.

Fetal complications

Prematurity and intra-uterine growth retardation is common complications. The literature shows that prematurity significantly increases fetal morbidity and mortality [9]. In our study, the newborn's renal balance was normal and no osmotic complications were noticed [10]. With the lack of data concerning CAPD patients we have compared different studies in patients on chronic hemodialysis Table 2:

Study	Hydramnios	Iugr	Prematurity
Chao [28]	30.3%	88.9%	27.8%
Ergolu [34]	28.57%	14.28%	42.85%
Chou [30]	71.42%	25.57%	ND
Doukkali [31]	50%	8.3%	8.3%
Our case	-	-	-

Table 2: Fetal complications.

CONCLUSION

The synthesis of our case and discussion leads us to believe that there is also a place for pregnancy in chronic ambulatory dialysis patients. Diagnosis of pregnancy should be made early to allow optimal multidisciplinary management and avoid maternal and fetal complications. The main complications encountered in peritoneal dialysis are preeclampsia, hydramnios, IUGR and prematurity, which requires rigorous surveillance, regular and careful maternal-fetal monitoring. The management of CAPD patients is done on a case-by-case basis, taking into account the

different starting and progression parameters of each patient. Therapeutic progress nevertheless allows us to foresee in the future the establishment of guidelines to improve the prognosis of these pregnancies. Although pregnancy in dialysis is technically possible, it is also strongly discouraged, and the ideal is to wait until kidney transplantation, when it is possible.

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