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Plasma Exchange during Pregnancy: A Case Report

B.A. Chouhani[1.2*], G. ELbardai[1.2], S. Bouchal[2.3], N. Kabbali[1.2], M. Faouzi Belahcen[2.3], T. Sqalli Houssaini[1.2]

[1]Nephrology, Dialysis and Transplantation Departement Hassan II university hospital, Fez, Morocco
[2]Laboratory of Epidemiology and Health Science Research (ERESS), Faculty of Medicine-Fez, Sidi Mohammed Ben Abdellah Univeristy, Fez, Morocco.
[3]Neurology Departement Hassan II Univeristy Hospital, Fez, Morocco

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***Corresponding author:** Basmat Amal Chouhani
Nephrology, Dialysis and Transplantation Departement Hassan II university hospital, Fez, Morocco

Abstract **Case Report**

Plasmapheresis is an attractive therapeutic option for a large number of pathologies that can occur during gestation. Although pregnancy is not a contraindication per se, due to unclear recommendations with inconclusive data on the presumed risk of maternal and fetal adverse events; its application remains infrequent. In this article we describe the case of a patient in the first trimester of pregnancy with myasthenic crisis who benefited from several PE sessions while focusing on the characteristics of this technique in pregnant women.

Keywords: Plasma Exchange, Pregnancy, presumed risk.

INTRODUCTION

Plasma exchange (PE) is an extracorporeal therapy used as in the management of many inflammatory neuropathies, especially during myasthenic crises where PE allows a rapid elimination of antibodies (Ac). They are distinguished from plasmapheresis by subtracting a larger plasma volume, usually 1 to 2 plasma masses. These fast techniques, effective but not devoid of risk especially during pregnancy.

We report a case of a gravid patient presenting with myasthenic crisis that was treated with plasma exchanges sessions while describing the peculiarities of such a therapy in this high-risk population.

OBSERVATION

CM, aged 23 years, followed during childhood for acute rheumatism with tonsillectomy in 2020, and for myasthenia during a year diagnosed following monocular ptosis, diplopia and swallowing disorder with a myasthenic score initially at 54.

Diagnosis criteria were as followed : a CT scan showing a thymoma, Acetylcholine receptor antibody were positive, the patient was treated by normal human immunoglobulin, Pyridostigmin and oral corticosteroid therapy with thymectomy done at the 7 month with good clinical course (myasthenic score at discharge at 88.

The current symptoms dates back to the beginning of December 2021 where the patient presented with a dysphonia, ptosis and a delay in menstruation, Beta hCG level was positive and pelvic ultrasound showing a pregnancy at 7 weeks of amenorrhea. She received a normal human immunoglobulin cure without any improvement with a myasthenic score of 55.

Patient needed 6 sessions of plasma exchanges at a rate of one day out of 2. We used a Multifiltrate of Fresenius, with a volume of 3500cc per day, by a temporary catheter 20 Cm 12 F with albumin 2 cycles and 1 cycle of fresh frozen plasma as a subsitute solution.

Anticoagulation was based on low molecular weight heparin with a loading dose of 70 to 80 IU/kg and maintenance dose of 15 to 20 IU / kg / h. Throughout the sessions the patient kept a correct blood pressure with a PAS between 115 and 100 mmhg and a PAD between 65 and 95 mmhg without hydro electrolyte disorders, without bleeding or infection of the catheter; and without the occurrence of an allergic reaction. Fetal heart sounds were regularly monitored

after the PE sessions without fetal complications. The evolution was marked by the improvement of the myasthenic score to 87.

DISCUSSION

The first plasma exchanges during pregnancy date back to 1968 in immunized gravid women to avoid the occurrence of hemolysis in the newborn [1]. Since, they have proven their efficacy in a significant number of pathologies occurring during pregnancy (PTT, HUS, autoimmune or metabolic diseases) or specific to it: secondary MAT during pregnancy, HELLP syndrome although the indications in this last latter remain controversial but can be used to dela childbirth in order to administer corticosteroid therapy for fetal maturation [2]. Managing myasthenic crisis during pregnancy requires special attention as both can have harmful effect on both mother and fetus. The course of the disease is unpredictable during pregnancy; however, worsening of symptoms most likely occurs during the first trimester and postpartum. The management of the myasthenic crisis during pregnancy should be individualized according to the severity of the crisis as well as the effectiveness of the different treatment modalities and their possible harmful effects on pregnancy, including mycophenolate mofetil and methotrexate given the teratogenic risk of these molecules [3]. The administration of immunoglobulins and the use of plasma exchanges is recommended in myasthenic crisis (grade 1 recommendations); providing a rapid response although of short duration [4].

Considering that many of the diseases listed in the ASFA guidelines may also be present during pregnancy, they recommend that PE can be safely performed during this period of time, while warning for potential side effects. In fact, in this population, adverse effects should theoretically be more frequent, given the physiological changes occurring during pregnancy. The plasma volume increases more than the increase in red blood cells with a tendency to hemodilution to avoid thromboembolic events and improve placental perfusion [5].

The increase in cardiac output that can be up to 50% at 8 weeks of amenorrhea and decrease in systemic vascular resistance that can result in a decrease in blood pressure, exacerbated during PE sessions [6]. The immune response also changes during pregnancy with an increase in susceptibility to viral infections that could also be aggravated by PE secondary to Immunoglobulin extraction [7].

In a meta-analysis of 279 studies, the safety profile of PE during pregnancy appeared to be comparable to the application of PE in non-pregnant patients; with a frequency of hypovolemia, due to variations of the oncotic pressure or levels of electrolytes that can ultimately affect placental blood flow [8]. Other effects reported in the literature are allergic reactions, thromboembolic and hemorrhagic events and complications related to vascular access, while no cases of cardiac, neurological or hyperthermia events have been reported [9, 10]. Obstetric events such as peri or postpartum haemorrhage; signs of fetal distress, defined as a change in fetal heart rate or ultrasound/Doppler during or shortly after PE, were anecdotal [11].

The rarity of side effects in this population is probably due to the drastic precautions taken during the sessions and that in general, the management is done in specialized centers with teams experienced in plasma exchanges [12].

In our patient no adverse events were reported during or after PE sessions; fetal exploration did not show any abnormality with the presence of cardiac activity.

The prescription of a PE session in a pregnant woman joins a usual prescription apart from certain peculiarities: the estimation of plasma volume is difficult given the variations in weight during pregnancy is generally underestimated and could result in ineffectiveness of PE. The use of PFCs may cause allergic reactions; this risk is reduced with the use of salt solutions or albumin with increased risk of depletion coagulopathy. The infusion of the salt solute also makes it possible to maintain an adequate intravascular volume, optimizing the placental infusion. During PE sessions, it is also preferable to keep the left lateral position especially in the 3rd trimester to avoid compression of the inferior vena cava [13]. Given the depletion of clotting factor, the risk of bleeding is higher during childbirth, so it is still a good idea to closely monitor the fibrinogen level and perform the minimum 24 hours before the expected date of delivery[8].

Fetal monitoring during or after the plasma exchange session remains debated ; and depends in most studies on local practices and the logistical challenges of each team.

CONCLUSION

The use of PA during pregnancy is probably a safe procedure if its done properly. It can avoid the use of potentially dangerous treatments for the fetus,and allows the continuation of pregnancy by reducing the risks associated with fetus prematurity. However, it would be preferable that PE be done in appropriate health structure with multidisciplinary team to better manage the high maternal and fetal risk.

Our case report try to enriched the existing literature available. Though, randomized controlled trials are neeeded to get better recommandations

regarding the indications and management of PE in pregnancy.

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