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# Pregnancy in a woman with pulmonary hypertension: favorable outcome with intravenous treprostinil

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**Summary**

Pulmonary hypertension (PH) presents a high risk for maternal mortality. The intravenous administration of treprostinil has demonstrated effectiveness for the treatment of PH, though documentations of its use during pregnancy are few. The authors present a 30-year-old gravid women with symptoms of PH at 23 weeks gestation. Treatment comprised of oxygen therapy, enoxaparin, and intravenous treprostinil from gestational week 25, following a successful elective cesarean section at 33 weeks gestation with favorable outcome. This report demonstrates the effectiveness of an intensive therapeutic protocol, including intravenous treprostinil, for the treatment of PH in pregnancy.

*Key words:* Pulmonary hypertension; Pregnancy; Treprostinil.

## Introduction

Pulmonary hypertension (PH) is a disorder defined by elevated mean pulmonary arterial pressure. Outcome of pregnancy in patients with PH have a high maternal mortality rate and early recognition of this condition with prompt evaluation and careful management is crucial.

## Case Report

A 30-year-old woman presented at the present institute gravid, 23 weeks gestation, with dyspnea on mild exertion, which became progressively more severe during the course of the pregnancy. She was heterozygous for a bone morphogenetic protein receptor type 2 mutation. Her medical history included surgical repair of a congenital pulmonary valve stenosis at the age of three years, with only mild residual pulmonic stenosis. She was then asymptomatic with normal pulmonary pressure, according to echocardiography. An echocardiogram conducted at presentation showed no signs of tricuspid regurgitation (TR), but indirect variables, including dilated main pulmonary artery and flattening of the intra-ventricular septum, suggested PH. Right heart catheterization performed at 24 weeks gestation confirmed diagnosis of mild PH with mean pulmonary artery pressure of 32 mmHg, normal wedge pressure without pharmacological reversibility. During pregnancy, oxygen therapy was administered to maintain saturation above 90%, enoxaparin was administered as anticoagulation therapy. At 25 weeks gestation, intravenous (IV) treprostinil was started and titrated up to 25 ng/kg/min. At 33 weeks gestation, an elective cesarean section was performed using spinal anesthetic technique, and a healthy baby girl was born. The patient was treated with intensive diuretic therapy to maintain negative fluid balance and with oxygen due to severe hypoxemia. She was admitted to the intensive care unit for seven days, and then to the internal medicine department for another two weeks. She was discharged at 21 days postpartum with oxygen therapy. Her condition gradually improved, and at 12 weeks follow-up, she no longer required oxygen therapy. Treptostinil was gradually withdrawn and she is currently being treated only with ambrisentan, ten mg daily. Figure 1 shows the pulmonary artery pressure estimated by echocardiography and functional capacity (FC) levels from baseline before pregnancy to 14 weeks postpartum.

## Discussion

The woman described insisted on continuing with the pregnancy, despite the current recommendation for early termination of pregnancy [1]. While early reports estimated 50% maternal mortality in PH patients, rates have decreased to 17% [2]. During pregnancy, blood volume, heart rate, cardiac output, and myocardial oxygen consumption increase considerably. In normal pregnancy increased lung plasma volume results in decrease in peripheral vascular resistance, which enables accommodation of the progressively increasing right ventricular load. In women with PH, peripheral vascular resistance does not decrease, and there is thus no restraint of the mounting pressure on the right ventricle. Treatment of PH requires a multi-disciplined approach, which is especially critical during pregnancy. The selection and combination of therapies depends on many factors, such as clinical severity, drug efficacy, and side effects. Among the advanced vasodilator therapies that have become available in the last decade for the treatment of PH, the prostacyclin analogues are the most potent medication [3]. As a pregnancy category B drug, treprostinil can potentially be used during pregnancy. Though the relatively long half-life of

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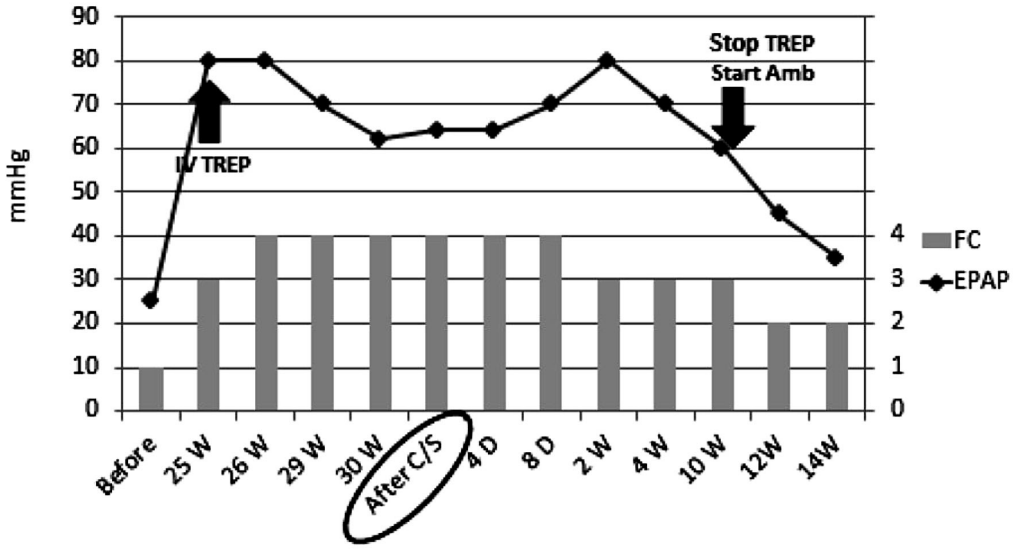


Figure 1. — Estimated pulmonary arterial pressure (EPAP) and Functional capacity (FC).

TREP: treprostinil
Amb: ambrisentan
C/S: cesarean section

treprostinil enables subcutaneous administration, [4] continuous IV administration is still considered the most potent means of administration [5]. The authors decided to initiate IV treprostinil therapy, and not oral therapy, in gestational week 25, despite only mild PH. They selected this potent treatment due to their anticipation of increasing pulmonary pressure consequent to the physiology of pregnancy. Repetitive measures of echocardiogram and functional capacity measured during pregnancy confirmed their expectations.

Documents of treprostinil treatment during pregnancy are few. Subcutaneous treprostinil was administered to one parturient woman in Jais *et al.*'s registry [6]. IV treprostinil was administered to four women with severe PH; all four delivered at term, without maternal or fetal mortality. [7] The present authors attribute their patient's survival to their adherence to an intensive therapeutic protocol. Treatment of PH during pregnancy is a relevant medical issue, since some women become pregnant despite medical advice and the high risks involved, and others are diagnosed with the disease only during pregnancy. This case demonstrates positive maternal and fetal outcomes following therapy with intravenous treprostinil, commenced prior to hemodynamic and clinical deterioration.

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