Maternal Death Following Medical Treatment of Paroxysmal Supraventricular Tachycardia in Late Gestation

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Summary

Objective: We present an unusual case of maternal death following medical treatment of paroxysmal supraventricular tachycardia (PSVT) in late gestation.

Case Report: A 30-year-old woman, gravida 1, para 0, came to the outpatient clinic of our obstetrics and gynecology department at 35 weeks of gestation. She had suffered from palpitation and shortness of breath that lasted 3 days. Electrocardiographic examination revealed PSVT. Although intravenous administration of verapamil (5 mg) and adenosine (36 mg) effectively prevented the relapse of PSVT, the patient lost consciousness 30 minutes after her last dose of adenosine with sudden-onset convulsions. Despite immediate administration of advanced cardiac life support, she showed no signs of improvement and died.

Conclusion: PSVT in late gestation can be associated with maternal death even following conversion to sinus rhythm using medical treatment. Clinical use of adenosine for PSVT should alert the clinician to the potential risk of administering a high dose of adenosine to a pregnant woman, which can lead to maternal mortality in late gestation. Administration of a high dose of adenosine was, in our opinion, partially responsible for the maternal death and intrauterine fetal demise in this case. [Taiwanese J Obstet Gynecol 2005;44(3):291-293]

Key Words: adenosine, late gestation, maternal death, paroxysmal supraventricular tachycardia

Introduction

Pregnant women have been reported to be in a proarhythmic state because of physiologic cardiovascular changes, including marked increases in stroke volume and cardiac output, that can become a hemodynamic burden during pregnancy [1]. Paroxysmal supraventricular tachycardia (PSVT) is one of the most common cardiac arrhythmias associated with pregnancy [2]. It can be treated effectively and safely using medical treatment without adverse effects to the mother or fetus [3-7]. We present an unusual case of maternal death and intrauterine fetal demise following medical treatment of PSVT in late gestation.

Case Report

A 30-year-old, gravida 1, para 0, woman came to the outpatient clinic of our obstetrics and gynecology department at 35 weeks of gestation. She had suffered from palpitations and shortness of breath that lasted 3 days. She denied any history of systemic diseases, but she did acknowledge not having regular prenatal care during pregnancy. Immediate electrocardiographic examination revealed PSVT. She was referred to the emergency room for further evaluation. She had a heart rate of 220 beats/min, blood pressure of 101/56 mmHg, respiratory rate of 20 breaths/min, and body temperature of 35.9°C. She was not overly distressed. Physical
examination revealed no thyromegaly, exophthalmos, or jugular vein distension. Bilateral lungs were clear to auscultation and percussion. Her extremities showed no symptoms of pedal edema or cyanosis. The fundal height of the uterus was consistent with dates. Fetal heart monitoring revealed a reactive heartbeat of 150 beats/min at baseline.

A single bolus of verapamil (5 mg) was given intravenously after the vagal maneuver failed to stop the PSVT (Figure 1). The first relapse of PSVT occurred after 2 hours, when her heart rate increased to 203 beats/min. Intravenous adenosine (6 mg) was given immediately, but a second relapse occurred shortly afterwards. A higher dose of adenosine (12 mg) was administered after 5 minutes. The patient’s heart rate returned to a sinus rhythm within 30 seconds of administration (Figure 2). An even higher dose of adenosine (18 mg) was administered after 25 minutes for a third relapse of PSVT (Figure 3). The patient was conscious throughout the administration of adenosine and the entire course of relapses. She lost consciousness 30 minutes after the last dose of adenosine with a sudden onset of convulsions that lasted 30 seconds, leading to apnea and shock. The patient exhibited E.M.V, symptoms on the Glasgow coma scale as well as bradycardia with undetectable blood pressure. Despite immediate administration of advanced cardiac life support (ACLS), she showed no signs of improvement and died. Concurrent sonographic examination of the uterus revealed intrauterine fetal demise during the ACLS procedure.

Discussion

Hemodynamic fluctuation during pregnancy may lead to the increased incidence and enhanced severity of PSVT [2,8]. The primary therapeutic treatment of PSVT is the vagal maneuver, but failure of this treatment has forced clinicians to consider a variety of pharmacologic agents as secondary treatment. Similar approaches are employed for all patients during this treatment. However, special attention should be given to drug selection when treating pregnant women. Drugs that can potentially affect the fetus should be avoided. Only propranolol (a β-blocker), verapamil (a calcium channel blocker), and adenosine are approved for PSVT by the US Food and Drug Administration. Adenosine is the most effective drug and has the fewest side effects in pregnant women with PSVT. Propranolol therapy is not only harmful to the fetus, it is also not as effective as verapamil and adenosine in the treatment of PSVT [9]. Although verapamil is as effective as adenosine, its potential side effects include hypotension, bradycardia, and congestive heart failure [3]. The minor side effects of adenosine include facial flushing, dyspnea, chest discomfort, and short-lived arrhythmias [3–7]. Some authors have reported other major sequelae, including syncope, convulsion, cardiac arrest, and shock [10–13]. The manufacturer recommends an initial intravenous administration of a bolus of adenosine, of 6 mg. If this is unsuccessful, the manufacturer recommends a second
dose of adenosine of 12 mg, but no larger doses [14]. When either drug (verapamil or adenosine) fails or induces shock, the clinician is forced to consider synchronized electrical cardioversion as tertiary treatment, the last alternative available for the treatment of PSVT [13].

The present report is of a case of PSVT in a pregnant woman in late gestation. The initial administration of verapamil (5 mg) failed to cure the PSVT. Administration of a high dose of adenosine (36 mg) was required to prevent the relapse of PSVT. However, the patient lost consciousness after the third high dose of adenosine, which led to apnea, convulsion, and shock. Despite immediate use of ACLS, the patient showed no signs of improvement and died. Concurrent sonographic examination of the uterus revealed intrauterine fetal demise during ACLS.

The cause of death in this case is still unclear. PSVT in late gestation can be associated with maternal death even following conversion to sinus rhythm using medical treatment. Numerous actions can lead to secondary seizure. Apnea resulting in hypoxemia is the most plausible explanation, because it triggers PSVT into convulsion and shock. The association between high-dose adenosine and shock remains doubtful. Autopsy was not approved by her family members. The patient could have died as a result of other undetermined diseases. We believe that a high dose of adenosine may be required to prevent the relapse of PSVT in pregnant women in late gestation. However, clinical use of adenosine for PSVT should alert the clinician to consider the potential risks of administering high-dose adenosine in pregnant women. Administration of a higher dose of adenosine was, in our opinion, partially responsible for the maternal death and intrauterine fetal demise in this case.

References