

Supraventricular Tachycardia in a Woman with Third Trimester Pregnancy and Atrial Septal Defect: A Case Report

Arun Prasad¹, Shyama², Sanjeev Kumar³, Ravi Kirti⁴

Author's Affiliation: ¹Assistant Professor of Pediatrics, Trauma & Emergency Department ³Assistant Professor, Department of CTVS ⁴Assistant Professor, Deptt. of Medicine, AIIMS, Patna, India. ²Senior Resident, Department of Medicine, Patna Medical College, Patna, India.

Corresponding Author:
Shyama, House No. 15, Gokul Marg, North S K Puri, Boring Road, Patna 800013.
Email-bubblypmch@gmail.com, drarunpd@gmail.com

Received on 13.04.2017,
Accepted on 24.04.2017

Abstract

Supraventricular Tachycardia (SVT) is one of the common cardiac arrhythmias. When it occurs during pregnancy it poses a challenge to the treating physician because of the safety concern of the fetus. The basic principle of managing acute episode of supraventricular tachycardia in any pregnant woman is same as in nonpregnant and Adenosine is the first line drug therapy. We report here a case of successful cardioversion of Supraventricular Tachycardia with Adenosine in a woman with 33 weeks of pregnancy with ASD secundum and pulmonary hypertension.

Keywords: Supraventricular Tachycardia; Pregnancy; Atrial Septal Defect.

Introduction

Arrhythmias are the most common cardiac complication during pregnancy in women with and without structural heart disease [1-3]. Arrhythmias may manifest for the first time during pregnancy or pregnancy can trigger exacerbations in women with pre-existing arrhythmias [1, 4-6]. Women with established arrhythmias or structural heart disease are at highest risk of developing arrhythmias during pregnancy.

Paroxysmal supraventricular tachycardia (PSVT) refers to intermittent pathologic tachycardia of supraventricular origin, excluding the subtypes of atrial fibrillation and flutter and multifocal atrial tachycardia. Its reported incidence is 35 per 100 000 person-years in the general population [7]. The main mechanism for the development of SVT is via re-entry, most commonly Atrioventricular Nodal Re-entrant Tachycardia (AVNRT) in 60% of cases and Atrioventricular Re-entrant Tachycardia in 30% [8].

In women with a history of SVT, episodes of SVT occur with increased frequency during pregnancy, especially in those with underlying congenital or structural heart disease [9, 10]. Proposed mechanisms include increased circulating levels of catecholamines

during pregnancy, increased adrenergic receptor sensitivity, and increased maternal effective circulating volume causing stretching of atrial wall. The therapeutic approach to arrhythmias in pregnancy is similar to that in the general patient without pregnancy. Diagnosis is done on the basis of typical history of sudden onset palpitation and ECG finding of Narrow complex tachyarrhythmia. Treatment of arrhythmias should be reserved for significant symptoms or arrhythmias resulting in hemodynamic compromise and risk to the mother and fetus. Echocardiography should be done to rule out any structural cardiac disease. Patients with a known history of uncontrolled arrhythmia should undergo treatment before becoming pregnant when possible [11]. We are reporting here a case of pregnant woman developing PSVT in third trimester of pregnancy who was successfully cardioverted with Adenosine.

Case Report

A 26 year old female with 33 weeks of pregnancy reported to us with complain of sudden onset palpitation for 6 hours. She was having intermittent episodes of palpitation for last six years which used to subside on its own after 4-6 hours. She was

diagnosed to have secundum type Atrial Septal Defect with mild PAH one year ago. She was put on Verapamil and she had no recurrence while she was on this antiarrhythmic medication. She underwent radiofrequency ablation and discontinued Verapamil after the procedure. After discontinuing Verapamil, she again had recurrence of SVT. She was put on Beta blocker but she did not tolerate this therapy due to nausea and vomiting. Meanwhile she became pregnant. Her first and second trimester were uneventful but she had a recurrence of palpitation during 33rd week of pregnancy. On examination she was conscious and oriented but apprehensive with heart rate of 158 per minute and Blood pressure of 90/60. Her chest was clear and there was a grade 2-3systolic murmur in tricuspid area. Fetal heart sound was present. ECG showed a narrow complex tachycardiasuggestive of SVT. Carotid sinus massage was done without response. Vagal maneuver (Valsalva) also failed. Then it was decided to give Adenosine. With 12 mg of Adenosine, given intravenously through right antecubitalvein, she cardioverted to normal sinus rhythm. Post Adenosine injection, fetal heart sounds were audible and fetal movements were also well appreciated by mother. Subsequent follow up till 37 week of pregnancy was uneventful with neither recurrence of PSVT nor any fetus related complain.

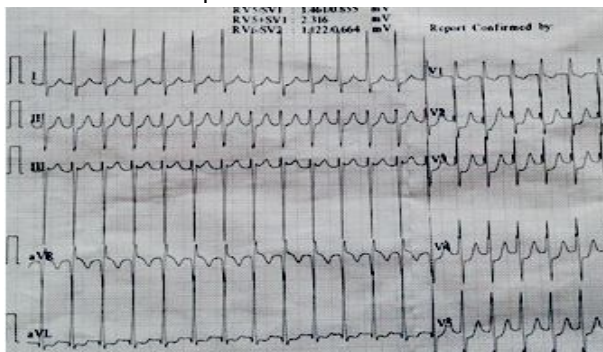


Fig. 1: SVT

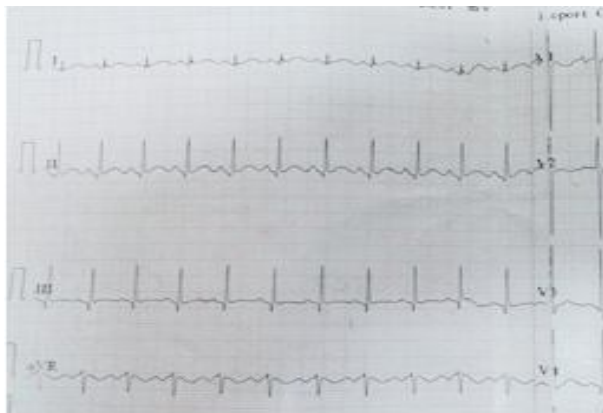


Fig. 2: Cardioversion to NSR

Discussion

SVT is usually well tolerated but occasionally can result in hemodynamic deterioration and impaired fetal blood flow [12, 13]. Patient with a prior history of SVT may experience exacerbations during pregnancy. The treating physician has to consider about the fetus also besides correcting physiological and hemodynamic abnormality in the pregnant patient. Hyperthyroidism should be excluded as a general rule.

AVNRT, the most common variety of SVT should initially be managed by use of vagal manoeuvre to terminate acute episodes of the arrhythmia. In hemodynamically stable patients who do not respond to vagal manoeuvre, Adenosine is the drug of choice as it is safe and terminates about 90% of paroxysmal SVT [14]. If Adenosine is ineffective, intravenous metoprolol or propranolol should be used. Verapamil is considered a third line agent [15]. For patients with frequent symptoms, metoprolol or verapamil can be used for prevention of SVT. Although digoxin is considered safe in pregnancy, it is often ineffective alone but has been used in combination with a β -blocker for AVNRT [16]. For those with significant symptoms who do not respond to atrioventricular nodal blocking agents, sotalol or flecainide may be used. In rare cases, drug refractory, hemodynamically significant AVNRT has been treated with catheter ablation with low radiation exposure to the fetus [17]. Management of PSVT due to Wolff - Parkinson - White syndrome is same as for acute episodes of AVNRT. For long-term therapy, when indicated, β -blockers, calcium channel blockers, digoxin, or flecainide may be used in patients with concealed accessory pathways. For patients with Wolff-Parkinson-White syndrome, verapamil or digoxin should not be used because of the risk of rapid accessory pathway conduction during AF. β -Blockers can be used cautiously in patients with Wolff-Parkinson-White syndrome, especially if the accessory pathway is not capable of rapid conduction. Although catheter ablation is the treatment of choice for Wolff-Parkinson-White in the non-pregnant patient, this is best avoided if possible during pregnancy. However, in select cases, catheter ablation has been performed safely [18]. Electric cardioversion is considered at all stages of pregnancy when arrhythmias are associated with hemodynamic instability or it is refractory to drug. Catheter ablation in the pregnant patient should only be undertaken in a situation where reasonable medical therapy is

ineffective, and the expected benefit outweigh the potential risks to the mother and fetus.

Conclusion

PSVT in pregnancy is a clinical conundrum as data is limited to observational studies and case reports. It is a relatively well tolerated arrhythmia but may result in hemodynamic instability or may compromise fetal circulation in pregnant woman. Acute management in pregnant patients with significant symptoms or hemodynamic instability is similar to that of non-pregnant patients, with special consideration to safety issues of fetus, especially during the first trimester. Adenosine is recommended as first drug to be used for acute management. Electric cardioversion is considered when arrhythmias are associated with hemodynamic instability or it is refractory to drugs.

Reference

1. Siu SC, Sermer M, Colman JM, et al. Prospective multicenter study of pregnancy outcomes in women with heart disease. *Circulation* 2001; 104:515.
2. Drenthen W, Pieper PG, Roos-Hesselink JW, et al. Outcome of pregnancy in women with congenital heart disease: a literature review. *J Am CollCardiol* 2007; 49:2303.
3. Drenthen, W, Boersma, E, Balci, A, et al. Predictors of pregnancy complications in women with congenital heart disease. *Eur Heart J In press*.
4. Lee SH, Chen SA, Wu TJ, et al. Effects of pregnancy on first onset and symptoms of paroxysmal supraventricular tachycardia. *Am J Cardiol* 1995; 76:675.
5. Doig JC, McComb JM, Reid DS. Incessant atrial tachycardia accelerated by pregnancy. *Br Heart J* 1992; 67:266.
6. Silversides CK, Harris L, Haberer K, et al. Recurrence rates of arrhythmias during pregnancy in women with previous tachyarrhythmia and impact on fetal and neonatal outcomes. *Am J Cardiol* 2006; 97:1206.
7. Orejarena LA, Vidaillet H Jr, DeStefano F, Nordstrom DL, Vierkant RA, Smith PN, et al. Paroxysmal supraventricular tachycardia in the general population. *J Am CollCardiol* 1998; 31:150–7.
8. Trohman RG, Parrillo JE. Direct current cardioversion: indications, techniques, and recent advances. *Crit Care Med* 2000; 28(Suppl 10):N170–N173.
9. Tawam M, Levine J, Mendelson M, Goldberger J, Dyer A, Kadish A. Effect of pregnancy on paroxysmal supraventricular tachycardia. *Am J Cardiol* 1993; 72:838–40.
10. Silversides CK, Harris L, Haberer K, Sermer M, Colman JM, Siu SC. Recurrence rates of arrhythmias during pregnancy in women with previous tachyarrhythmia and impact on fetal and neonatal outcomes. *Am J Cardiol* 2006; 97:1206–12.
11. Alan D. Enriquez, Katherine E. Economy, Usha B. Tedrow. *Arrhythmia and Electrophysiology Circulation* 2014; 7:961-967.
12. Peleg D, Orvieto R, Ferber A, Ben-Rafael Z. Maternal supraventricular tachycardia recorded as apparent fetal heart rate in a case of fetal demise. *Acta Obstet Gynecol Scand*.1998; 77:786–787.
13. Smith WM, Gallagher JJ, Kerr CR, et. Al. The electrophysiologic basis and management of symptomatic recurrent tachycardia in patients with Ebstein’s anomaly of the tricuspid valve. *Am J Cardiol*. 1982; 49:1223–1234.
14. Elkayam U, Goodwin TM. Adenosine therapy for supraventricular tachycardia during pregnancy. *Am J Cardiol*. 1995; 75:521–523.
15. European Society of Cardiology Committee for Practice Guidelines. Writing Committee to Develop Guidelines for the Management of Patients With Supraventricular Arrhythmias. *Circulation*. 2003; 108:1871–1909.
16. Cox JL, Gardner MJ. Treatment of cardiac arrhythmias during pregnancy. *ProgCardiovasc Dis*.1993; 36:137–178.
17. Bongiorno MG, Di Cori A, Soldati E, et. al. Radiofrequency catheter ablation of atrioventricular nodal reciprocating tachycardia using intracardiac echocardiography in pregnancy. *Europace*. 2008; 10:1018–1021.
18. Kanjwal Y, Kosinski D, Kanj M et. al. Successful radiofrequency catheter ablation of left lateral accessory pathway using transseptal approach during pregnancy. *J Interv Card Electrophysiol*. 2005;13: 239–242.