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Case Report

Flecainide responsive neonatal supraventricular tachycardia

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Abstract

Supraventricular tachycardia (SVT) is the most common tachyarrhythmia in neonates with incidence varying from 1 in every 250-1000 pediatric patients. Atrioventricular re-entrant tachycardia utilizing an atrioventricular bypass tract is the most common form of SVT in the neonatal period. It is a condition requiring emergency care and cardiac monitoring. Case description: This case report is on a term male newborn diagnosed with SVT at birth. The baby had tachycardia (>220/min) with ECG suggesting SVT. Rhythm reverted to normal with peri-ocular ice pack application during the first episode. On subsequent monitoring for the next 5 days, the baby didn't have arrhythmias. On day 11 follow-up, the baby had SVT and was treated with periocular ice pack application, Inj. Adenosine, Inj. Diltiazem, Inj. Amiodarone sequentially for which SVT was resistant. Baby responded to oral flecainide and was discharged on the same. At 1 month review, baby was accepting feeds well, with adequate weight gain and heart rate maintaining between 120-130/min with normal rhythm, continued flecainide. Baby was under regular follow-up in pediatric cardiology and started on propranolol and flecainide. Serial ECG and echocardiogram were normal. Currently, baby is 2.5 years old, developmentally normal, hemodynamically stable and on drugs propranolol and flecainide. Conclusion: In recent years, Flecainide has been used effectively in fetal and neonatal SVTs.
Keywords:-Intensive care, Arrhythmias, Cardiovascular medicine, Neonatal intensive care

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1. Introduction

Supraventricular tachycardia (SVT) is the most common tachyarrhythmia in neonates, varying incidence from 1 in 25000 to 1 in 250.[1-2] It is one of the neonatal emergencies requiring intense cardiac monitoring and appropriate treatment. The peak occurrence of SVT is in infancy. Though spontaneous resolution is a known entity, some infants may require antiarrhythmic drugs and rarely catheter ablation.[1] This case report is on a neonate with SVT with structurally normal heart who responded to Flecainide therapy.

2. Case Report

A gravida 2 para 1 mother with gestational diabetes mellitus on oral hypoglycemic drugs came for routine prenatal checkup at 38 weeks of gestation. Continuous Cardiotocography showed fetal heart rate (FHR) variations between 50-200/min. Her previous records of FHR were normal.

There was no history of congenital cardiac defects in the family. Pregnancy was terminated by emergency caesarean section (Indication: Suspected Fetal arrhythmias). A male baby weighing

3.09 kg was delivered who had APGAR scores of 8/10 and 9/10 at 1 min and 5 min of life respectively.

At birth, baby had HR > 220/min with good perfusion, respiratory rate was 55/min with no retractions and his temperature was 36.5 c. Baby was shifted to intensive care unit and a 12 Lead electrocardiogram done was suggestive of supraventricular tachycardia. At 20 mins of life, four limb saturation was above 94% and blood pressure checked in all four limbs were normal (66/43mm of Hg) . At 1 hour of life, rhythm was reverted to normal (150/min) by peri-ocular ice pack application. Baby was under strict cardiac monitoring during which the heart rate was between 120 – 160 / minute, with regular rhythm. 2D Echocardiography did not reveal structural/vascular anomalies. Over next 24 hours, he did not

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have recurrence of SVT. Direct breastfeeding was established on day 2 of life. On day 4 of life, repeat ECHO showed good ejection fraction (75%). Baby was discharged on day 5 of life with mother being explained about underlying condition and need for regular follow-up.

During his follow-up visit on day 11, there were no complaints from mother regarding baby activities. On examination, he had a heart rate > 220/min with good peripheral pulses with other vital parameters being normal. There was no evidence of cardiogenic shock or congestive cardiac failure. ECG done was suggestive of SVT. Baby was admitted in intensive care unit. On this occasion, the rhythm could not be reverted with peri ocular ice pack application. He was administrated 2 doses of Inj. Adenosine (0.1mg/kg followed by 0.2mg/kg) IV for which the SVT was resistant. Hence first dose Inj. Amiodarone (10mg/kg/dose) was given over 30 mins. second doses at an interval of 4 hours was administered due to persistent SVT, followed by Amiodarone infusion at the rate of 10mcg/kg/min. Baby was under strict cardiac monitoring during the above measures and did not have any signs of shock/failure or any other form of arrhythmia. He was fed with expressed breast milk through cup. Despite 6 hours of Amiodarone infusion, rhythm persisted to be consistent with SVT. Hence oral Flecainide (2mg/kg/dose twice a day) was started as per guidelines.[3] The possibility of need for ablation therapy was advised to the parents. After 24 hours of flecainide administration heart rate remained stable between 140-150/min and gradually amiodarone was withdrawn over next 24 hours and stopped. On day 14 of life baby was discharged oral flecainide.

At 1 month review, baby was with adequate weight gain (4.150kgs) and heart rate maintaining between 120-130/min with normal rhythm and flecainide was continued. Baby was under regular follow-up with Paediatric Cardiologist and started on propranolol along with flecainide. Serial ECG and echocardiogram were normal. Currently, baby is 2.5 years old, developmentally normal, hemodynamically stable and on drugs propranolol and flecainide.

3. Discussion

The most frequent form of tachyarrhythmia in children is Supraventricular tachycardia (SVT). Neonatal SVT is defined as abnormally rapid rhythm in infants >220/min that originates proximalto the bifurcation of the bundle of His.[3] Treatment for episodes of SVT depends on age of the patient, individual clinical situation, duration of the tachycardia, underlying cardiac anatomy and associated hemodynamic compromise, or ventricular tachycardia. In case of asymptomatic SVT, vagal maneuvers may be effective. First drug of choice is Adenosine; its advantages include shorthalf-life and minimal or absent negative inotropic effects. Our case did not respond to Adenosine therapy. Digoxin may be administered in all forms of supraventricular tachycardia in which the atrioventricular node is involved in perpetuation of the tachycardia. This drug was not tried in thiscase because AV node involvement was not suspected. Amiodarone was selected as the second line drug in the reported case. Because, when compared to other antiarrhythmics, Amiodarone exerts its highest potential by prolonging the duration of action potentials. This drug has not gained popularity in young infants because of its pharmacokinetics, with a plasma half-life of 6 to 8 weeks, and its significant rate of systemic and proarrhythmic effects.[4] In the reported case, SVT was resistant to Amiodarone. In recent years, Flecainide has been used effectively in fetal and neonatal SVTs. It is a potent sodium channel blocker which has been used alone or in combination with other antiarrhythmic agents in the acute and long-term management of SVT.[5-7] Spontaneous cessation of SVT can be expected in most neonates and infants during the first year of life. Prophylactic pharmacological treatment in infants is always advisable because recognition of tachycardia is often delayed until the occurrence of symptoms.[8]

4. Conclusion

Neonatal Supraventricular tachycardia (nSVT) is a potentially life-threatening cardiac rhythm abnormality that requires prompt diagnosis and treatment. The reported newborn had a structurally normal heart with nSVT who showed a transient response to peri-ocular ice application, but later due to persistence required pharmacological management. Child did not respond to Adenosine and Amiodarone, while Flecainide proved to be effective in controlling the abnormal rhythm and reverting it to normal. This report emphasizes the importance of early identification, suitable drug therapy, and ongoing monitoring in managing nSVT. Also, it accentuates the probability of Flecainide as an effective treatment option when other drugs fail. The reported newborn was asymptomatic and had achieved normal growth and development, highlighting the positive outcomes with timely and tailored medical interventions.

5. Source of Funding

None.

6. Conflict of Interest

None.

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