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CLINICAL AND PARACLINICAL MANIFESTATIONS IN SUPRAVENTRICULAR ARRYTHMIA IN CHILDREN

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ABSTRACT

Background: *Supraventricular arrythmias (SVAs) are a prominent class of cardiac rhythm problems in children defined by an irregular heartbeat that begins above the ventricles.*
Objective: *To provide a summary of the clinical and paraclinical manifestations of SVA.*
Methods: *The study included a review of prior studies on paediatric supraventricular arrhythmias.*
Results: *SVAs are a prevalent form of arrhythmia in young people, with an estimated incidence of 1% to 2%. Children's supraventricular arrhythmias may possess a complicated aetiology that includes genetic predispositions and anatomical cardiac problems. The symptoms might be as mild as palpitations, lightheadedness, dyspnoea, or even more severe lke syncope. Most symptoms occur before the age of four months during the first six months of life. Various manoeuvres have been implicated in the diagnosis of SVA to include obtaining a thorough history about the onset and recurrence of palpitations, syncope, chest pain, dyspnea, heart failure, and drug use, and physical examination. Some 20% of asymptomatic SVT infants are incidentally diagnosed. The mainstay of paraclinical diagnosis of SVA is provided by the ECG, which uncovers typical patterns of irregularly irregular rhythms in AF and sawtooth patterns in atrial flutter. Intermittent arrhythmias may be captured with Holter monitoring and event recorders. Echocardiography also plays an important role in assessing the underlying structural heart disease, whereas blood tests may be required for detecting electrolyte imbalances or thyroid disorders that may precipitate the arrhythmias.*
Conclusion: *In conclusion, to avoid potential problems in the aetiology and treatment of supraventricular arrhythmias in children, a complete approach that considers individual circumstances is required.*
KEYWORDS: *supraventricular arrythmia, children*

INTRODUCTION

A common type of arrhythmia that affects people of all ages is supraventricular arrhythmias. [1]Depending on the rhythm, frequency, and severity of any organic heart malfunction or other noncardiac disorders, SVTs can occur with a wide range of conditions and exhibit a wide range of clinical symptoms, from asymptomatic to collapse.

A narrow complex tachycardia is typically the result of supraventricular tachycardias, barring rate-dependent aberration or basal bundle branch obstruction. Atrioventricular reentry tachycardia and atrioventricular nodal reentry tachycardia are the most prevalent types of supraventricular tachycardia in newborns and infants, while 10%–15% of supraventricular tachycardias in all age groups are focal atrial tachycardias.[2]

Usually identified by mistake in children, supraventricular arrhythmias are generally asymptomatic and well treated. Heart palpitations, dyspnoea, chest discomfort, lightheadedness, dizziness, syncope, and presyncope are common symptoms, however they are not always present.[3]

Arrhythmias are caused by three mechanisms: triggered, automated, and reentrant. The continuous, repeating propagation of electrical activity in a circular motion is known as reentrant or reciprocating tachycardia. The aberrant spontaneous impulse beginning in a tissue is the source of automatic tachycardias. Impulsive behaviour is referred to as triggered activity.[4]

The most prevalent kind of AVNRT causes the atria and ventricles to contract virtually simultaneously, making it difficult to observe P-waves on the surface ECG during tachycardia. [5]When they are seen, they might be faint, appearing as a pseudo-S' deflection in the inferior leads or a pseudo-r' wave in lead V1.[5]

Premature atrial contractions can appear with an abnormally shaped premature P wave.
Pre-excited atrial fibrillation, which is rare and marked by a wide, irregular QRS of variable duration and shape, can occur in patients with antegrade route conduction because the condition can conduct at various rates down both the AV node and the pathway.[5]

Within the atrium, there are two processes that give rise to atrial tachycardia (AT): focal and re-entrant. The most common kind of AT observed in clinical practice is classic atrial flutter.
Atrial flutter is responsible for 8% of supraventricular tachyarrhythmias in children older than a year, 11% to 18% of neonatal tachyarrhythmias, and 30% of foetal tachyarrhythmias.[6]

In the acute diagnosis and treatment of SVT, current guidelines from the European Society of Cardiology still support the use of adenosine and vagal manoeuvres as first-line treatments. [2] SVT cessation rates for the Valsalva technique range significantly from 19% to 54%. [7]Another option is to provide an adenosine challenge through a large peripheral or central

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vein right after a rapid saline flush. In the event that the patient exhibits signs of haemodynamic compromise, direct current cardioversion should be performed right away. Catheter ablation can also be used. The main treatments for AT include medications, electrical cardioversion, catheter ablation, and transoesophageal atrial pacing (TEAP). [6]

OBJECTIVE

To provide a broad summary of the clinical and paraclinical manifestations of childhood supraventricular arrhythmias.

METHODOLOGY

A thorough analysis of the literature was carried out, with an emphasis on the clinical presentation, and paraclinical manifestations of SVAs in children from article databases between 2020 and 2024

RESULTS

Clinically, SVAs may present in children with palpitations, fatigue, dizziness, exercise intolerance, or symptoms of heart failure in extreme cases, especially in infants. Whereas older children might complain of a feeling of racing or irregular heartbeat, younger children and infants may also present nonspecifically with irritability, poor feeding, or failure to thrive. The paraclinical manifestations that help in diagnosis include electrocardiography, used to detect the characteristic rhythm abnormalities; Holter monitoring in the case of intermittency or asymptomatic instances; and echocardiography, helpful to rule out structural heart diseases. Electrophysiological studies are put to use in pinpointing the exact mechanisms of arrhythmias and in the support of targeted interventions like catheter ablation in cases that may be complicated..

SUGGESTIONS

Early detection of the arrythmia helps in timely diagnosis and treatment of the disease. Compliance to the advised treatment measures is very important.

CONCLUSION

Supraventricular tachycardias (SVTs) are a common cause of presentation to primary and secondary care services. Understanding the clinical and paraclinical manifestations is required for timely diagnosis and treatment of supraventricular arrythmia. The underlying cause, symptom frequency, and patient preference all affect long-term treatment.

FIGURES

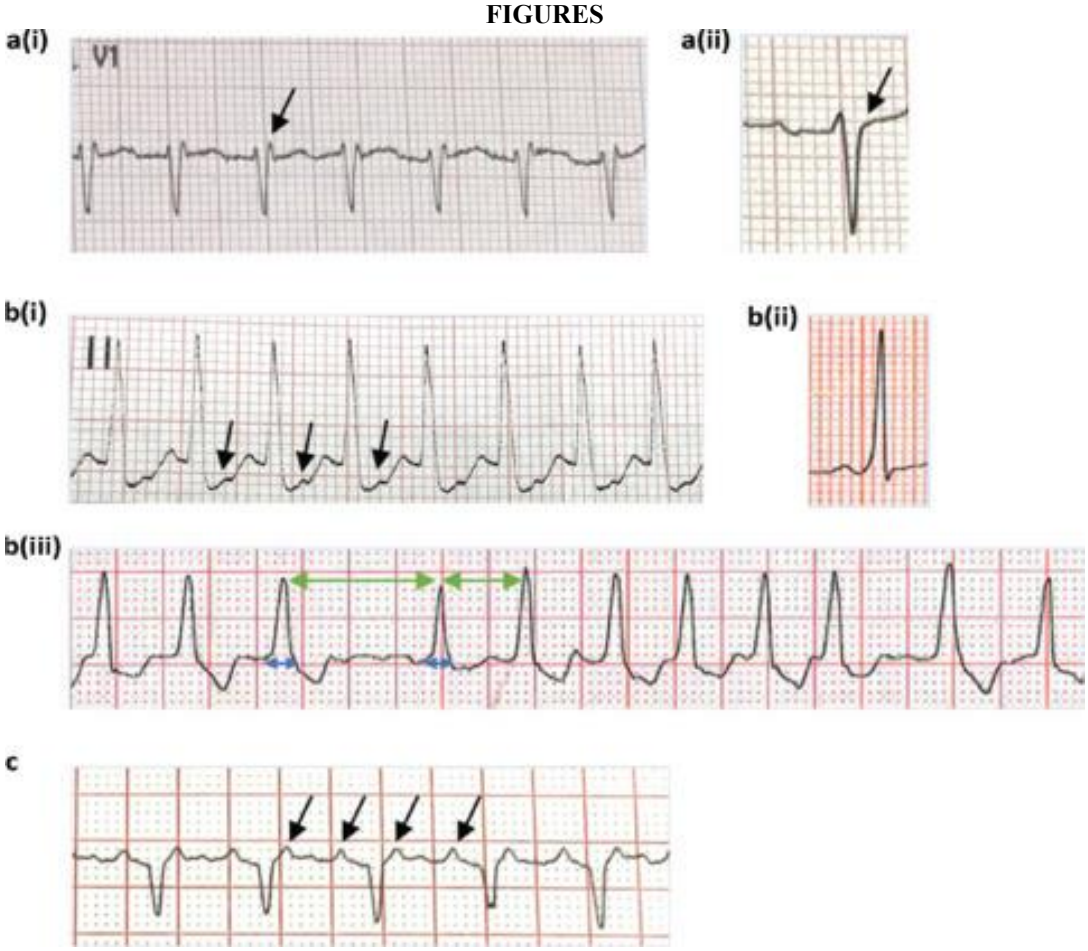


Figure 1 [5]

a. Pseudo r'wave and sinus rhythm for comparison
b. Narrow complex tachycardia with visible retrograde P-waves that appear separate to the QRS and sinus rhythm and pre excited atrial fibrillation
c. Atrial tachycardi

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REFERENCES

1. *M. H. Wu, H. C. Chen, F. Y. Kao, and S. K. Huang, "Postnatal cumulative incidence of supraventricular tachycardia in a general pediatric population: A national birth cohort database study," Heart Rhythm, vol. 13, no. 10, pp. 2070–2075, Oct. 2016, doi: 10.1016/j.hrthm.2016.06.006.*
2. *H. C. Kafalı and Y. Ergül, "Common Supraventricular and Ventricular Arrhythmias in Children," Turkish Archives of Pediatrics, vol. 57, no. 5, p. 476, Sep. 2022, doi: 10.5152/TURKARCHPEDIATR.2022.22099.*
3. *E. A. Schlechte, N. Boramanand, and M. Funk, "Supraventricular Tachycardia in the Pediatric Primary Care Setting: Age-related Presentation, Diagnosis, and Management," Journal of Pediatric Health Care, vol. 22, no. 5, pp. 289–299, Sep. 2008, doi: 10.1016/j.pedhc.2007.08.013.*
4. *R. Adwan, S. Thatcher, S. Russo, and S. Tisma-Dupanovic, "Arrhythmias in children: Too fast or too slow," Prog Pediatr Cardiol, vol. 65, p. 101520, Jun. 2022, doi: 10.1016/J.PPEDCARD.2022.101520.*
5. *S. E. Williams, M. O'Neill, and I. D. Kotadia, "Supraventricular tachycardia: An overview of diagnosis and management," Clinical Medicine, vol. 20, no. 1, pp. 43–47, Jan. 2020, doi: 10.7861/CLINMED.CME.20.1.3.*
6. *F. Drago and P. P. Tamborrino, "Atrial Flutter in Pediatric Patients.," Card Electrophysiol Clin, vol. 14, no. 3, pp. 495–500, Aug. 2022, doi: 10.1016/J.CCEP.2022.05.005.*
7. *S. Yáñez Mesía, V. Gómez Barrena, B. Salamanca Zarzuela, I. Garralda Torres, and I. Benitez Gómez, "Modified Valsalva manoeuvre in paroxysmal supraventricular tachycardia: Case series," Anales de Pediatría (English Edition), vol. 99, no. 2, pp. 138–140, Aug. 2023, doi: 10.1016/J.ANPEDE.2023.04.013.*