



ORIGINAL ARTICLE

Supraventricular tachycardia in newborns and its association with gastroesophageal reflux disease[☆]

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KEYWORDS

Newborn;
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Abstract

Introduction: Supraventricular tachycardia (SVT) is the most common arrhythmia in the neonatal period, but its association with other triggering processes is not well established. The aim of the study was to analyse the possible relationship between neonatal SVT and gastroesophageal reflux disease (GERD), a condition which was recently linked to atrial arrhythmias.

Material and methods: A retrospective longitudinal descriptive study was conducted over a period of 5 years on newborns who were diagnosed with SVT in a level III neonatal unit, assessing morphological aspects, associated symptoms, and treatments received. Its association with GERD and the impact of this on SVT was studied.

Results: Eighteen patients (1.2 per 1000 newborns) were diagnosed with SVT. Fifty percent of them were combined with clinically significant GERD ($P = .01$), and all of them received drug treatment. The average time of control of SVT without GERD since diagnosis was 6 days (95% CI: 2.16–9.84, with a median of 3) and 7.6 days when both pathologies were present (95% CI: 4.14–10.9, with a median of 7) ($P = .024$).

Conclusions: Patients with SVT in the neonatal period frequently have GERD, and this combination leads to more difficulty in controlling the tachycardia. The reflux could act as a trigger or perpetuator of arrhythmia, therefore it is important to find and treat GERD in infants with SVT.

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PALABRAS CLAVE

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Taquicardia supraventricular en recién nacidos y su asociación con reflujo gastroesofágico**Resumen**

Introducción: La taquicardia supraventricular (TSV) es la arritmia más común en el periodo neonatal, sin embargo, su asociación con otros procesos desencadenantes no está bien establecida. El objetivo de este estudio es analizar la posible relación entre TSV neonatal y el reflujo gastroesofágico (RGE), por ser una dolencia relacionada recientemente con las arritmias auriculares.

Material y métodos: Se realizó un estudio descriptivo longitudinal retrospectivo de recién nacidos que fueron diagnosticados de TSV en una unidad neonatal de nivel III, durante un período de 5 años, valorando los aspectos morfológicos, la sintomatología asociada y los tratamientos recibidos. Se estudió su asociación con el RGE y la repercusión de este sobre la TSV.

Resultados: Dieciocho pacientes (1,2 de cada 1.000 recién nacidos) fueron diagnosticados de TSV. El 50% asociaban RGE con repercusión clínica ($p=0,01$) y todos ellos recibieron tratamiento farmacológico. El tiempo medio de control de la TSV sin RGE desde el diagnóstico fue de 6 días (IC 95%: 2,16–9,84, con una mediana de 3) y de 7,6 días cuando estuvieron las 2 dolencias asociadas (IC 95%: 4,14–10,9, mediana de 7) (valor $p=0,024$).

Conclusiones: Los pacientes con TSV en el periodo neonatal tienen frecuentemente RGE, y esta asociación genera una mayor dificultad para el control de la taquicardia. El reflujo podría actuar como desencadenante o perpetuante de la arritmia, por eso es importante buscar y tratar el RGE en los recién nacidos con TSV.

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Introduction

Neonatal tachycardia is defined as a resting heart rate (HR) of 182 beats per minute (bpm) when the baby is not crying.^{1,2} Supraventricular tachycardia (SVT) is the most common tachyarrhythmia in the neonatal period and usually presents with a HR of more than 200 bpm and with a narrow QRS complex. In 80% of patients, it originates through a mechanism of retrograde conduction via an accessory pathway between the ventricle and the atrium, with an abrupt onset and termination. In 15% of patients it results from atrial ectopic beats, while 5% of cases correspond to re-entrant nodal tachycardias.^{3,4} Approximately half of these patients present with heart failure, with suspicion of sepsis in some cases. The tachycardia may be detected in the foetal period, most frequently between weeks 28 and 33 of gestation, possibly manifesting with hydrops.⁵

The key element in the management of haemodynamically unstable patients with tachycardia is electric cardioversion. However, in stable patients, SVT is generally managed with a stepwise approach, starting with vagal manoeuvres and, should the patient not respond, initiation of pharmacological treatment with adenosine (0.03–0.25 mg/kg) or ATP (0.05–0.1 mg/kg), which cause a transient block in the atrioventricular node.^{6,7} If the patient does not respond to these drugs, treatment may continue with the administration of amiodarone, beta-blockers or digoxin. Flecainide and sotalol have proven effective in the management of refractory SVT.^{8,9} Supraventricular tachycardia frequently recurs after acute therapy (80%). Maintenance of antiarrhythmic prophylaxis is recommended

in children aged less than 1 year because recurrent SVT may be difficult to detect in newborns and infants. Most patients are asymptomatic and require no further treatment by age 1 year.^{9,10}

Gastro-oesophageal reflux is usually a physiologic process in newborns,^{11,12} although some cases may require pharmacological treatment for adequate control.^{13,14} Although there is no published evidence of an association between SVT and gastro-oesophageal reflux disease (GERD), the oesophagus is located immediately posterior to the left atrium, and the two structures share some innervations. In recent years, evidence has emerged of a potential association between the development of atrial fibrillation and GERD.¹⁵ Atrial fibrillation is the most common sustained arrhythmia in adults, and SVT is the most frequent one in children; their pathophysiology is nearly the same from a structural standpoint. Atrial fibrillation may result from vagal nerve overstimulation.^{16,17} Thus, it would be logical to hypothesise that the presence of acid in the oesophagus could trigger tachycardia.

The aim of this study was to assess whether the presence of GERD in the neonatal period may trigger SVT, and the impact of GERD on its adequate control.

Patients and methods**Patients**

We conducted a longitudinal retrospective study between January 2011 and December 2015 of children born in the

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