



## ORIGINAL ARTICLE

# Ischaemic stroke in children with cardiopathy: An epidemiological study<sup>☆,☆☆</sup>



M. Vázquez-López<sup>a,\*</sup>, P. Castro-de Castro<sup>a</sup>, E. Barredo-Valderrama<sup>a</sup>,  
M.C. Miranda-Herrero<sup>a</sup>, N. Gil-Villanueva<sup>b</sup>, A.J. Alcaraz-Romero<sup>c</sup>,  
A. Jiménez-de Domingo<sup>a</sup>, S.I. Pascual-Pascual<sup>d</sup>

<sup>a</sup> Sección de Neuropediatría, Hospital Materno Infantil Gregorio Marañón, Madrid, Spain

<sup>b</sup> Sección de Cardiología Infantil, Hospital Materno Infantil Gregorio Marañón, Madrid, Spain

<sup>c</sup> Sección de Unidad de Cuidados Intensivos Pediátricos, Hospital Materno Infantil Gregorio Marañón, Madrid, Spain

<sup>d</sup> Sección de Neuropediatría, Hospital Infantil La Paz, Madrid, Spain

Received 26 September 2015; accepted 29 March 2016

Available online 26 November 2017

### KEYWORDS

Congenital heart disease;  
Heart disease;  
Arterial ischaemic disease;  
Heart surgery;  
Catheterisation;  
Hypoplastic left heart syndrome

### Abstract

**Introduction:** Ischaemic stroke is rare during childhood. Congenital and acquired heart diseases are one of the most important risk factors for arterial ischaemic stroke (AIS) in children.

**Patients and methods:** We conducted a retrospective study of all children with AIS and heart disease diagnosed between 2000 and 2014.

**Results:** We included 74 children with heart disease who were eligible for inclusion. 60% were boys with a mean stroke age of 11 months. 20% of the patients died during the study period. 90% of the patients had a congenital heart disease, while cyanotic heart disease was identified in 60%. Hypoplastic left heart syndrome was the most frequent heart disease. In 70% of patients AIS was directly associated with heart surgery, catheterisation or ventricular assist devices. Most patients with AIS were in the hospital. Seizures and motor deficit were the most frequent symptoms. Most patient diagnoses were confirmed by brain CT. The AIS consisted of multiple infarcts in 33% of the cases, affected both hemispheres in 27%, and involved the anterior and posterior cerebral circulation in 10%.

<sup>☆</sup> Please cite this article as: Vázquez-López M, Castro-de Castro P, Barredo-Valderrama E, Miranda-Herrero MC, Gil-Villanueva N, Alcaraz-Romero AJ, et al. Ictus isquémico en niños con cardiopatía: estudio epidemiológico. Neurología. 2017;32:602–609.

<sup>☆☆</sup> This study was presented as an oral communication at the 38th Annual Meeting of the Spanish Society of Paediatric Neurology (SENEP) in Logroño, 21–23 May 2015. It was awarded one of the 5 prizes for best oral communications at the 2015 SENEP meeting.

\* Corresponding author.

E-mail address: [vazquezlopezmaria@gmail.co](mailto:vazquezlopezmaria@gmail.co) (M. Vázquez-López).

**PALABRAS CLAVE**

Cardiopatía congénita;  
Enfermedad cardiaca;  
Ictus isquémico;  
Cirugía cardiaca;  
Cateterismo;  
Ventrículo izquierdo hipoplásico

**Conclusions:** Arterial ischaemic strokes were mainly associated with complex congenital heart diseases, and heart procedures and surgery (catheterisation). AIS presented when patients were in-hospital and most of the patients were diagnosed in the first 24 hours.

© 2015 Sociedad Española de Neurología. Published by Elsevier España, S.L.U. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

**Ictus isquémico en niños con cardiopatía: estudio epidemiológico****Resumen**

**Introducción:** Los ictus isquémicos son poco frecuentes en la infancia. Las cardiopatías tanto congénitas como adquiridas son uno de los factores de riesgo más importante para presentar un ictus en la edad pediátrica.

**Pacientes y métodos:** Estudio retrospectivo descriptivo de niños con cardiopatía diagnosticados de ictus arterial isquémico entre enero del 2000 y diciembre del 2014.

**Resultados:** Cumplieron los criterios de inclusión 74 pacientes, el 60% varones. La mediana de edad del ictus fue de 11 meses. Fallecieron un 20% de los pacientes. La cardiopatía era congénita en un 90%, cianógena en un 60%. El ventrículo izquierdo hipoplásico fue la cardiopatía más frecuente. El ictus estuvo relacionado temporalmente con una cirugía cardiaca, cateterismo o asistencia ventricular en el 70% de los casos.

La mayoría de los ictus ocurrieron en el hospital. La forma de presentación más frecuente fue el déficit motor y las convulsiones. El diagnóstico se realizó mediante TC craneal en la mayoría de los casos. El ictus fue múltiple en el 33% de los casos y bihemisférico en el 27%, y afectaba a la circulación anterior y posterior cerebral en el 10%. En un 10% de los casos se produjo una recurrencia del ictus.

**Conclusiones:** Las cardiopatías congénitas complejas y las intervenciones cardiacas, la cirugía y los cateterismos fueron los principales factores asociados con el ictus isquémico. El ictus se produjo en pacientes hospitalizados y el diagnóstico se realizó en las primeras 24 h en la mayoría de los pacientes.

© 2015 Sociedad Española de Neurología. Publicado por Elsevier España, S.L.U. Este es un artículo Open Access bajo la licencia CC BY-NC-ND (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

**Introduction**

Ischaemic strokes are uncommon in children. Congenital and acquired heart diseases are one of the most frequent risk factors for stroke in children, and are considered to be responsible for 10%-30% of paediatric strokes.<sup>1</sup> Despite the significant reduction in mortality due to advances in the management of children with heart disease and the availability of clinical guidelines for the management and prevention of thromboembolic events, the prevalence of ischaemic strokes in these patients has remained stable over the past 30 years.<sup>2</sup>

Ischaemic strokes in patients with heart diseases can be triggered by various mechanisms<sup>3-5</sup>:

- The formation of emboli in left heart cavities in patients with cardiac arrhythmias, complete or partial ventricular dysfunction, abnormal valves, catheterisation, heart surgery, or the presence of prosthetic material, etc.
- The formation of emboli in the venous system or right heart cavities; through a right-to-left shunt, emboli would bypass pulmonary circulation, being transported directly to the cerebral arteries.

- Cerebral venous thrombosis due to a combination of several frequent predisposing factors in heart disease patients: venous stasis, dehydration, venous hypertension, and polycythaemia.
- Artery diseases: some patients with heart diseases may also present stenotic lesions in the intracranial arteries.

Paediatric stroke particularly occurs in patients with congenital heart disease (mainly in complex cases presenting right-to-left shunt) or cyanotic heart disease.

In addition to congenital heart diseases, other heart-related causes of stroke in children are myocardopathy, especially dilated and non-compaction cardiomyopathies, arrhythmias, acute myocardial infarction secondary to coronary artery disease, cardiac tumours, infectious endocarditis, and myocarditis.<sup>6-8</sup> In these cases, the embolic potential is related to thrombosis caused by the blood stasis manifesting in these diseases.

Very frequently, stroke in these patients is temporally related to some procedure, whether it be heart surgery,<sup>9</sup> catheterisation,<sup>10</sup> or the use of circulatory support devices (ECMO, Berlin-Heart).<sup>11,12</sup>

Cardioembolic strokes clinically manifest with sudden-onset focal neurological deficit or seizures. Partial

Download English Version:

<https://daneshyari.com/en/article/8689448>

Download Persian Version:

<https://daneshyari.com/article/8689448>

[Daneshyari.com](https://daneshyari.com)