Abstract: P4645

Prevalence of interatrial communications in 7,000 newborns from a large, prospective population study

Authors:
E Blixenkrone-Moeller1, S Dannesbo1, C Pihl1, A-S Sillesen1, O Voegg1, A Axelsson Raja1, S Colan2, L Mertens3, N Vejlstrup4, H Bundgaard4, K Iversen1, 1Herlev Hospital - Copenhagen University Hospital - Copenhagen - Denmark, 2Boston Children's Hospital, Department of Cardiology - Boston - United States of America, 3Hospital for Sick Children, Department of Cardiology - Toronto - Canada, 4Rigshospitalet - Copenhagen University Hospital, Department of Cardiology, The Heart Centre - Copenhagen - Denmark,

On behalf: Copenhagen Baby Heart Study group

Topic(s):
Congenital Heart Disease: Echocardiography

Citation:
Funding Acknowledgements:
Danish Heart Association, Danish Children's Heart Foundation, Candy's Found., Toyota Found., Herlev-Gentofte Hospital Research Found., Gangsted Found.

Introduction: The prevalence of any interatrial communication (IAC) (patent foramen ovale (PFO) or atrial septal defect (ASD)) in newborns has previously been reported to be between 24% and 92%. However, previous studies were relatively small, and no universal classification of IACs exists. We proposed a new echocardiographic diagnostic algorithm developed in collaboration with a group of international experts to classify IACs based on echocardiographic findings on subxiphoid transthoracic echocardiographic (TTE) images of the atrial septum in unselected newborns.

Purpose: To determine the prevalence of IACs (PFO and ASD) in newborns based on the new diagnostic algorithm.

Method: Echocardiograms of newborns (age 0-30 days) consecutively included in a large, prospective population study (n=25,000) were analyzed using the new algorithm. The algorithm classifies IACs into PFO and ASD based on transthoracic echocardiographic (TTE) findings including size and number of the communication(s) as well as the morphology and structure of the atrial septum, taking the normal fetal development into consideration. An IAC was classified as a PFO when either there was only one communication located in the upper 2/3 of the atrial septum with a visible communication having a diameter of ≥3.4 mm or a channel-like structure; or there was no visible communication on 2D but acceleration of colour Doppler flow crossing the septum was documented. An IAC was classified as an ASD if the diameter of a visible communication was >3.4 mm, or the communication was located in the lower 1/3 part of the atrial septum, or more than one communication was present. No visible communication on 2D and no flow acceleration despite possible colour Doppler flow crossing the atrial septum was classified as an absence of IAC.

Preliminary results: As of 3 February 2019, 9,028 echocardiograms have been analyzed. A total of 2,026 (22.4%) were excluded due to poor image quality of the atrial septum. Of the 7,002 included echocardiograms, an IAC was detected on the TTE images in 85.9% of the newborns (median age 12 days [IQR 8;15], 47.9% females). According to the algorithm 78.7% of the newborns were classified as having a PFO (see Table 1) whereas 7.2% were classified as having an ASD.

Conclusion: An IAC was present in the vast majority of newborns aged 0-30 days. PFOs were 11 times more frequent than ASDs.

<table>
<thead>
<tr>
<th>Type of interatrial communication</th>
<th>Prevalence (n=7,002)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patent foramen ovale</td>
<td>78.7%</td>
</tr>
</tbody>
</table>
Abstract: P4645

Prevalence of interatrial communications in 7,000 newborns from a large, prospective population study

Authors: E Blixenkrone-Moeller1, S Dannesbo1, C Pihl1, A-S Sillesen1, O Voegg1, A Axelsson Raja1, S Colan2, L Mertens3, N Vejlstrup4, H Bundgaard4, K Iversen1. 1Herlev Hospital - Copenhagen University Hospital - Copenhagen - Denmark, 2Boston Children’s Hospital, Department of Cardiology - Boston - United States of America, 3Hospital for Sick Children, Department of Cardiology - Toronto - Canada, 4Rigshospitalet - Copenhagen University Hospital, Department of Cardiology, The Heart Centre - Copenhagen - Denmark.

On behalf: Copenhagen Baby Heart Study group

Topic(s): Congenital Heart Disease: Echocardiography

Introduction: The prevalence of any interatrial communication (IAC) (patent foramen ovale (PFO) or atrial septal defect (ASD)) in newborns has previously been reported to be between 24% and 92%. However, previous studies were relatively small, and no universal classification of IACs exists. We proposed a new echocardiographic diagnostic algorithm developed in collaboration with a group of international experts to classify IACs based on echocardiographic findings on subxiphoid transthoracic echocardiographic (TTE) images of the atrial septum in unselected newborns.

Purpose: To determine the prevalence of IACs (PFO and ASD) in newborns based on the new diagnostic algorithm.

Method: Echocardiograms of newborns (age 0-30 days) consecutively included in a large, prospective population study (n=25,000) were analyzed using the new algorithm. The algorithm classifies IACs into PFO and ASD based on transthoracic echocardiographic (TTE) findings including size and number of the communication(s) as well as the morphology and structure of the atrial septum, taking the normal fetal development into consideration. An IAC was classified as a PFO when either there was only one communication located in the upper 2/3 of the atrial septum with a visible communication having a diameter of ≥3.4 mm or a channel-like structure; or there was no visible communication on 2D but acceleration of colour Doppler flow crossing the septum was documented. An IAC was classified as an ASD if the diameter of a visible communication was >3.4 mm, or the communication was located in the lower 1/3 part of the atrial septum, or more than one communication was present. No visible communication on 2D and no flow acceleration despite possible colour Doppler flow crossing the atrial septum was classified as an absence of IAC.

Preliminary results: As of 3 February 2019, 9,028 echocardiograms have been analyzed. A total of 2,026 (22.4%) were excluded due to poor image quality of the atrial septum. Of the 7,002 included echocardiograms, an IAC was detected on the TTE images in 85.9% of the newborns (median age 12 days [IQR 8;15], 47.9% females). According to the algorithm 78.7% of the newborns were classified as having a PFO (see Table 1) whereas 7.2% were classified as having an ASD.

Conclusion: An IAC was present in the vast majority of newborns aged 0-30 days. PFOs were 11 times more frequent than ASDs.

<table>
<thead>
<tr>
<th>Type of interatrial communication</th>
<th>Prevalence (n=7,002)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atrial septal defect</td>
<td>7.2%</td>
</tr>
<tr>
<td>No interatrial communication</td>
<td>14.1%</td>
</tr>
</tbody>
</table>

Prevalence of interatrial communications in newborns aged 0-30 days.