Heart Murmurs in the Neonate

An approach to the neonate with a heart murmur

This guideline is adapted from the West of Scotland guideline which in turn is based on the PECSIG 2013 guideline

Introduction

A heart murmur heard in the neonatal period may be associated with congenital heart disease.
However, it must be remembered that not all infants with congenital heart disease have a heart murmur in the neonatal period.

A neonate with any of the following findings needs urgent assessment even if a murmur is not present:

- signs of heart failure or shock (see below),
- lower limb saturations <96% in the absence of respiratory disease,
- >3% difference between pre and post ductal saturations
- absent/weak femoral pulses.

Management

The following recommendations represent the minimum requirements to ensure the safe management of neonates with heart murmurs and the timely identification of congenital heart disease.

- All infants with a heart murmur on neonatal examination should be reviewed by a senior paediatrician (middle grade or consultant).

- All infants with a heart murmur should remain in hospital until >24 hours old (unless definitive diagnosis is reached before this).

- All infant with a heart murmur should have a detailed cardiovascular clinical examination which must include measurement of pre and post ductal saturations.

- If a baby with a heart murmur is discharged before a definitive diagnosis is reached, the parents should be given a written

information leaflet describing warning signs and advising them of what to do in the event that their baby became unwell.

Examination

- Dysmorphic features
- Pulses – compare brachial and femoral
- Presence or absence of heave (best felt just below xiphisternum)
- Heart sounds
- Murmur – intensity, character, location and radiation

Investigations

- Pre and post ductal saturations (ESSENTIAL)
    - >3% difference between pre and post and/or a reading <96% needs further investigation [1]
- ECG (WHERE PRACTICAL)
    - Useful but not sensitive or specific for abnormalities other than AVSD
    - A normal neonatal ECG shows right axis deviation because of the right ventricular dominance of the newborn heart. Left axis deviation in a newborn is a significant abnormal finding and should prompt further investigation.
    - Whilst an abnormal ECG should prompt further investigation, a normal ECG should not be considered reassuring if there are abnormal clinical findings

There is no evidence to support the use of CXR or 4 limb blood pressure measurements in the assessment of neonates with heart murmurs [3,4,5,6].

Echocardiography

This is the gold standard investigation for differentiating between innocent and pathological murmurs.

1. Likely significant congenital heart disease –urgent echocardiogram and review (same day)

Infants with a heart murmur and **any** of the following warning signs:

- lower limb saturations < 96%;
- >3% pre / post ductal difference; absent/weak femoral pulses;
- signs of heart failure or shock.

These infants require admission SCBU for further assessment, consideration of prostaglandin and urgent discussion +/- transfer to a cardiac centre.

Discuss with Cardiology Consultant on call via

Yorkhill switchboard 0141 201 0000

If Dr Irving is available to perform echocardiogram while retrieval is awaited then this can be linked by telemedicine link or used to update surgical centre. **This should not be allowed to delay transfer.**

2. Asymptomatic but clinically pathological murmur – soon echocardiogram (pre-discharge or as soon as possible within 1 week)

Infants without any of the above warning signs but with **any** of the following abnormal clinical findings:

- dysmorphism;
- heave;
- abnormal heart sounds;
- loud murmur (>2/6);
- pansystolic, diastolic, continuous murmur;

- murmur location other than left sternal edge /radiation;
- abnormal ECG .

Discuss with Dr Irving re timing of echo, prior to discharge where practicable.

If Dr Irving unavailable for the next week then other options for discussion

Dr Walayat Consultant Cardiologist or Dr Dzung Nguyen Paediatrcian with expertise in cardiology RHSC Edinburgh via secretary 0131 536 0627

If neither available then discuss with on call cardiology at Yorkhill

3. Low risk of congenital heart disease –

Well infants with no signs of heart failure, normal pulses, lower limb saturations >96%, soft (1-2/6) systolic murmur at the left sternal edge with no radiation.

Book into next available urgent slot in Dr Irving's cardiology clinic (monthly clinic)

Email Karen Di Cara (secretary) to ensure follow up appointment is made. **Use Referral Proforma for Cardiology clinic.**

Fill out open access sheet for ward 15 including date of clinic to indicate when open access will end

Give parents the information sheet including phone number of where to phone if concerned

Family history

Referral proforma for Cardiology Clinic
from Post Natal Ward or SCBU ONLY

Details (sticker if available)
Name
Address
CHI

Contact Phone number

Examination findings

Loudness
Location
Site
Heave **Y** **N**

ECG **Y** **N** MUST BE ATTACHED IF PERFORMED

Pre ductal saturations Post ductal saturations

(>3% difference must be investigated urgently)

Senior REVIEW Y N By whom

Family History

Parent information sheet given Y N

Signature
Designation
Date

Return to Karen Di Cara, secretary to Dr Clare Irving

References

(also see PECSIG "The investigation and management of neonatal heart murmurs: literature review."

1.**Impact of pulse oximetry screening on the detection of duct dependent congenital heart disease: a Swedish prospective screening study in 39 821 newborns.** Anne de Wahl Granelli et al *BMJ* 2009;338;a3037

2. **Neonatal ECG screening for congenital heart disease in Down syndrome.** Narchi H *Ann Trop Paediatr* 1999; 19:51-4

3.**Can Cardiologists Distinguish Innocent from Pathologic Murmurs in Neonates?** Andrew S Mackie et al *The Journal of Pediatrics* 2009;154:50-4

4.**Diagnostic value of chest radiography and electrocardiography in the evaluation of asymptomatic children with a cardiac murmur.** Birkebaek NH, Hansen LK, Oxhoj H *Acta Paediatr.* 1995 Dec;84(12):1379-81

5.**Noninvasive tests in the initial evaluation of heart murmurs in children.** Newburger JW, Rosenthal A, Williams RG, Fellows K, Mettinien OS. *N Engl J Med.* 1983 Jan 13;308(2);61-4

6.**Variability of four limb blood pressure in normal neonates.** D S Crossland, J C Furness, M Abu-Harb, S N Sadagopan, C Wren *Arch Dis Child Fetal Neonatal Ed* 2004;89:F325-F327

Based on the PECSIG 2013 guideline

Authors - PECSIG Neonatal Murmur Guideline Group

(Kathleen O'Reilly, Hilary Maddicks, Vishna Rasiah, Venu Gopalan with BCCA input from Rob Martin and John Simpson)

HEART MURMURS IN THE NEWBORN

INFORMATION FOR PARENTS

What is a heart murmur?

A heart murmur is an extra noise which is heard when the heart is listened to with a stethoscope.

Does a heart murmur mean there is heart problem?

No. Most babies with heart murmurs have completely normal hearts. These babies have what are known as "innocent" or "normal" heart murmurs. However, sometimes a heart murmur can be a sign that there is a problem with the heart like a small hole or a narrowing and this is why all babies with heart murmurs are reviewed.

How will I know if my baby has a heart problem?

Your baby will be seen in clinic within 6 weeks. If the murmur can still be heard then your baby will have further tests.

What should I look out for?

Most babies with heart murmurs remain well but if your baby becomes unwell they should be seen urgently by a doctor. Signs to look out for include: breathing difficulties; breathless or sweaty when feeding; poor feeding; blue colour of skin and lips or mottled skin.

What should I do if my baby becomes unwell?

You should seek urgent medical advice. Phone 01896 826015 (Ward 15 BGH) . Explain that your baby has a heart murmur and has become unwell.

Points to remember

A heart murmur is an extra noise heard when listening with a stethoscope.

Most babies with heart murmurs have completely normal hearts.

A heart murmur can sometimes be a sign of an underlying heart problem.

IF YOUR BABY BECOMES UNWELL SEEK URGENT MEDICAL ADVICE.