CHEST PAIN IN CHILDREN AND ADOLESCENTS

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Chest pain, previously a symptom prevalent in the elderly, is becoming an increasingly common complaint in children and adolescents. This must in part be due to the widespread concern of the possibility of an underlying heart disease. On the contrary, chest pain of a cardiac origin in children is not common. The anxiety generated by the patient and family (and sometimes doctor) is frequently in excess of the severity of the symptom. However, it is important to identify those children with chest pain who requires further evaluation and treatment.

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I. History

A thorough history is necessary for the accurate diagnosis of chest pain. This includes any past events, medical conditions and the family medical history. It may be necessary to speak with the patient and the family members separately if stress or social problems are present. The following points should be addressed.

- Chest pain – frequency, nature, intensity, duration, location, precipitating events and relieving factors
- Effect of the chest pain on the child’s lifestyle and activity level
- Past medical/surgical history, including past history of cardiac disease, if any
- A complete review of the systems
- Family history, including sudden events/deaths or cardiovascular disease
- Social and school history

II. Important clues from the physical examination

The aim of the clinical examination is to determine if there is a pathologic cause for the chest pain.

- General appearance and condition
- Vital signs, including blood pressure measurement
- Examination of the chest wall (deformities, scars), palpation of the sternum, musculature
- Cardiac examination (murmurs, clicks, added sounds)
- Auscultate the lungs for any abnormal findings
- Abdominal examination
- Assessment of the child psychological state

III. Cardiac causes of chest pain

Although a constant cause of concern, cardiac causes are uncommon causes of chest pain. However, despite being rare, some of these conditions are important as they may lead to significant morbidity and mortality.

- anatomic lesions (aortic stenosis, aortic aneurysm with dissection, ruptured sinus of Valsalva, coronary artery abnormalities, mitral valve prolapse)
• acquired lesions (Kawasaki disease with coronary artery involvement, cardiomyopathy, myocarditis, pericarditis, accelerated atherosclerosis from hyperlipidemia)
• arrhythmias (premature atrial/ventricular contractions, supraventricular, ventricular dysrhythmias)

IV. Non-cardiac causes of chest pain

These form the major causes of chest pain in children and adolescents.

• Idiopathic
• Musculoskeletal (muscle pain, costochondritis, excessive exercise, cervical rib, precordial catch syndrome, trauma, child abuse)
• Pulmonary (pleurodynia, reactive airways disease, pneumonia, chronic cough, pneumothorax, pneumomediastinum, pulmonary embolism, foreign body aspiration)
• Psychiatric (stress, depression, hyperventilation syndrome, panic attacks, Munchhausen/Munchhausen-by-proxy syndrome)
• Gastrointestinal (oesophagitis, Mallory Weiss, syndrome, achalasia, gastro-oesophageal reflux, gastric disease)
• Others

V. Investigations and when to refer

It must be stressed that despite the numerous possible causes of chest pain highlighted above, the clinician must not be tempted to embark on an unnecessary protocol of investigations. Many causes can be excluded on the history and physical examination alone. Furthermore, over-investigation is not only expensive, it may add to the psychological burden of the child and family (and doctor as well). Simple and readily available investigations (for example, ECG, chest x-ray) carried out in appropriate situations may be useful to rule out some medical conditions or provide a baseline for further evaluation. Depending on what is the most likely cause of the chest pain, more sophisticated investigations or referral to the relevant specialist can then be carried out if necessary.

VI. Management

Management of the child depends on the cause of the chest pain. “Perceived” chest pain, or fatigue experienced after exercise, is common especially for those not accustomed to the degree of exercise. Advice on the need for graded training to increase stamina, regular training sessions and adequate warm-up before the exercise
may be the start to enjoying the benefits of exercise. Where the cause is idiopathic or psychogenic, again appropriate advise, reassurance and encouragement for the child and the family may be all that is required.

**Conclusion**

Clinicians are often uncomfortable with chest pain in children and adolescents. This is often related to the many ‘uncertainties’ associated with this symptom. Fortunately, majority of the cases are benign. An adequate history and thorough examination are mandatory to exclude the rare or serious condition. Judicious investigations and appropriate referrals are necessary in some situations. In many others, sound advice and reassurance are important.
Chest pain in children

History

1. Nature of pain: duration, character, location, intensity, frequency, aggravating and relieving factors
2. Relation to position/activity
3. Child’s lifestyle and activity/sports performance
4. Past medical history and medication
5. Family and social history

Physical examination

General appearance and state (e.g., growth, comfortable, anxious etc)
Praecordial/chest examination
Cardiac examination (cyanosis, pulses, BP, murmurs, clicks, displaced apex beat, gallop)
Pulmonary signs (rate of breathing, use of accessory muscles, breath sounds)
Abdominal examination

Cardiac causes
- aortic stenosis
- coarctation
- coronary artery abnormalities
- myocarditis
- cardiomyopathy
- mitral valve prolapse
- dissecting aneurysm
- arrhythmias

Other Causes
- Musculoskeletal
- Pulmonary
- Gastrointestinal
- Psychogenic
- Idiopathic

CXR/ECG/Echocardiogram

Refer to cardiologist

Treat cause
Refer to specialist if necessary

Reassure patient and family