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Managing a Child With Heart Palpitations

When children or adolescents present complaining of heart palpitations, first determine just what they are describing. "Heart palpitation" is a very vague term and could mean anything: Patients might say their "heart is racing," they feel like they "skipped a heartbeat," or it could just be a greater awareness of their heart beating.

A comprehensive history is important in determining the possibility of a significant arrhythmia. Every child walking in with a history of palpitation does not have a cardiac arrhythmia.

Significant arrhythmias are far fewer in children than adults. More common in children are noncardiac issues, such as heart palpitations associated with anxiety and panic attacks or minor arrhythmias such as premature atrial and ventricular beats.

Normal heart rhythm is sinus rhythm, and sinus tachycardia is not a problem most of the time. Sinus tachycardia has many possible etiologies. It can occur when a child or adolescent exercises, feels anxious, or is running a fever. Fortunately,

ly, sinus tachycardia is not something we normally worry about. Children are easily excited and may experience their heart racing. They may report that they feel short of breath during an episode, which may point to anxiety. In some cases, excessive caffeine intake may be responsible for these symptoms.

Ask about onset and duration of symptoms during history taking. For example, patients who report a rapid heartbeat that lasts a half-hour or longer are more of a concern than those who report a few minutes or seconds of symptoms where it feels like "their heart is popping out of their chest." Also inquire

about dizziness, which could indicate their blood pressure falls during an episode.

Pediatricians who feel comfortable addressing cardiac issues should try to differentiate benign sinus tachycardia from the more concerning forms: supraventricular tachycardia and ventricular tachycardia.

If parents report the child's heart was

racing and it was 120 beats per minute (bpm), you can reassure them. If the heart rate is 120, 130, 140, 150, or even 160, it is generally nothing to worry about—it is bound to be sinus tachycardia. Even very fast sinus tachycardia may be normal given the circumstances. For example, a 16-year-old athlete at the peak of physical activity might have a heart rate closer to 190 or 200 bpm. That is fast, but it is appropriate for the age and level of activity.

More worrisome is supraventricular tachycardia (SVT), which has an entirely different mechanism in terms of electrophysiology of the heart, reentry being responsible for most. The electrical conduction system of the heart may have a bypass tract or a dual atrioventricular node which allows for reentry to occur. In general, the heart rate of 200 bpm or higher is likely to be SVT and warrants referral to a cardiac specialist.

Patients with heart rates falling in the in-between range (170-200 bpm) may have sinus tachycardia or SVT and should also have a work-up. Attempting to document the rhythm during episodes becomes important in these children.

SVT can occur in children of any age, including newborns and infants. It usually starts abruptly and unpredictably—out of the blue, the heart starts racing. The child can be completely inactive at the time. For a minority, exercise may be the trigger. The rapid heartbeat may be short or last for many hours, and then the episode stops as suddenly as it started. It is not life threatening unless the child is in incessant SVT for hours.

A routine ECG can sometimes help pediatricians with their differential diagnosis. Markers, such as a bypass tract, can show up on the ECG tracing. If a pre-excitation pattern is seen, further work-up may be needed, even in asymptomatic children incidentally discovered on routine testing for other reasons. Unequivocal diagnosis of SVT requires ECG documentation of the abnormal rhythm during an episode.

Because episodes of SVT tend to be unpredictable, trying to record the rhythm during the episode is not an easy exercise. One solution is to ask parents to record the child's pulse rate or heart rate during an episode, while the patient is complaining of symptoms. Going to the nearest emergency department increases the possibility of ECG identification of the SVT.

A pediatrician can also prescribe 24-hour Holter monitoring to try to catch an episode. If a patient is referred to a pediatric cardiologist, the patient is often monitored for a longer period of time in an attempt to catch the arrhythmia, such as 48-72 hours. Another helpful device is a loop recorder, which is worn constantly; it records and erases the ECG data after each half-hour. Parents are instructed to save the data after the episode by pushing a button. The data can then be transmitted to the monitoring company via tele-

phone. The signal is turned into an ECG rhythm strip and sent to the physician for further analysis and necessary action.

The most worrisome arrhythmia in children is ventricular tachycardia (VT). It is a life-threatening arrhythmia. Fortunately, it is the most uncommon. Nonetheless, people who treat children have to be aware of conditions that are a setup for this kind of arrhythmia.

Hypertrophic cardiomyopathy is one such condition. It is a genetic condition leading to abnormality of the ventricular muscle. The abnormality produces a structural change with thickening of the heart muscle in an asymmetric fashion. The thickness may cause obstruction of the left ventricular outflow tract. In addition, such an individual is prone to VT. The presenting symptom for such individuals tends to be loss of consciousness or a fainting episode with the arrhythmia, generally occurring in the setting of vigorous physical activity. It can be a silent condition, fainting or collapse being the first symptom for some patients. Diagnosis is made by a combination of tests, including echocardiogram and ECG. Genetic testing is now available for the condition but does not help with practical management issues.

If a child is reporting other problems, such as constant fatigue and/or symptoms with minor daily activities, it suggests the possibility of myocarditis, usually related to viral infections. The heart of a child with such an infection becomes dilated and does not contract well. These patients are prone to VT. While some children with myocarditis recover, others may suffer permanent damage. The heart may remain dilated and prone to VT.

Another rare condition to include in your differential diagnosis is prolonged QT interval syndrome. The condition is genetic in nature and tends to run in families. The mechanism involves gates or ion channels in cell membranes that normally regulate the influx of sodium, potassium, and calcium. In a child with the syndrome, the gates remain open too long, thereby allowing too much sodium or calcium to enter the cells, and VT can ensue. ECG tracings and a history of syncope can be diagnostic. Genetic testing is available and helpful.

Ventricular tachycardia is very worrisome because it can be fatal within minutes. Therefore, VT is an emergency in most instances, although there are some benign forms that are well tolerated. The distinction can sometimes require an electrophysiology study. The placement of automatic external defibrillators in public places has enhanced the chances of survival in patients who experience rapid VT. ■

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