Paediatric Watch
Lessons from the frontline
Edition 1/2024

Myocarditis in a 7-year-old

A 7-year-old child was brought into a metropolitan emergency department by ambulance at approximately 19:30 after collapsing at home. The mother reported the child had been unwell for two days with fevers, abdominal pain, and lethargy. The child's sibling and parents were asymptomatic.

On arrival the child's respiratory rate (37 breaths per minute) and heart rate (144 beats per minute) were both mildly elevated (Yellow Zones). Oxygen saturation was 95% in room air, capillary refill 3 seconds and temperature 38.6◦C. The child was drowsy however they were responding appropriately to questions asked by the mother.

The child was allocated a triage category 3. The child was reviewed by a junior medical officer within 30 minutes and a further history revealed a 3-day history of intermittent abdominal pain and fever, non-bilious vomiting, decreased oral intake and reduced urine output.

On assessment the child had a soft abdomen with some tenderness centrally. There was no tenderness over the right iliac fossa, however there was some guarding noted in the central abdomen.

The child was reported as 'irritable' however there were no signs of neck stiffness, had normal work of breathing and no rash. The initial impression was that of gastroenteritis, with a provisional diagnosis of mesenteric adenitis. A urine sample showed a trace of ketones, and a blood glucose level was 3.6 mmol/L.

The child's heart rate remained in the Yellow Zone and staff were unable to obtain a Blood Pressure (BP), which was attributed to the child crying. The child was administered a dose of paracetamol and ondansetron, and a trial of fluid was commenced.

After 2 hours in the emergency department the child was tolerating oral fluids and the temperature had come down to 37.6◦C. The child continued to have an elevated heart rate (Yellow Zone) and prior to discharge staff were able to obtain a BP which was low in the Yellow Zone (85/60).

Both the heart rate and BP were attributed to the child being mildly dehydrated, and in view of the child being afebrile and tolerating fluids, was discharged home in the care of the mother who was told to 'return if she was worried'. On discharge at approximately 22:00 it was noted the child was refusing to walk and was carried out of the department by the mother.

The mother and child returned to a tertiary emergency department via ambulance at approximately 01:30 the next morning. It was reported the child woke up screaming at home in bed, arching his back for a short period of time before the child became unconscious. The child was in asystole when the ambulance arrived. Resuscitation efforts were unsuccessful. Postmortem results revealed cause of death was myocarditis

Lessons:

The symptoms of myocarditis may be subtle and non-specific such as fatigue, malaise and abdominal pain, making the diagnosis difficult in children. It is mostly a clinical diagnosis, based on the history and physical examination of the

child. Examination may be normal initially, however with worsening illness there can be signs of increased respiratory rate or effort, elevated heart rate, low blood pressure, and enlarged liver.

When suspecting myocarditis, investigations could include a chest x-ray, electrocardiogram, cardiac enzymes and echocardiogram. Consider myocarditis in your differential diagnosis when non-specific symptoms occur such as unexplained collapse, abdominal pain, vomiting and signs of cardiac failure.

Diagnosis of gastroenteritis and premature closure

Gastroenteritis often begins with vomiting, followed by diarrhoea, often with abdominal pain and fever. Clinicians should consider a range of possible causes for vomiting and abdominal pain without diarrhoea. This child had a reported loss of consciousness at home that was not explored further – this is a red flag. It was unclear if the treating doctor was aware of the reported loss of consciousness handed over by the ambulance officers to the triage nurse. The child was also irritable with an altered level of consciousness at triage.

Fixation on temperature

In this case there was fixation on the child's temperature and response of the temperature to antipyretics. The focus should be on the full range of vital signs including heart rate and blood pressure and whether they were explained by the provisional diagnosis and associated fever.

Hypotension

Hypotension is a late sign of shock in children. A common pitfall in the recognition of shock is attributing difficulty obtaining a BP to technical issues rather than recognising the presence of hypotension. A BP will be difficult to obtain if it is barely there. A BP should be done manually if initially not recordable using an automatic machine. Always escalate an unrecordable BP as per your local Clinical Emergency Response System.

The child refusing to walk

A child without an injury who is refusing to mobilise on discharge is a red flag. In NSW there have been several cases involving delayed recognition of serious illness where a child refused to walk and was carried by a parent from an inpatient unit or emergency department on discharge. If an older child is being carried in or out of the department, this may be an important sign that they are seriously unwell.

References

The Royal Children's Hospital Melbourne (2020) Gastroenteritis, Clinical Practice Guidelines website, accessed November 2023.