Benign acute childhood myositis in an Accident and Emergency setting

L M Rennie, N F Hallam, T F Beattie

Four children presented to the Accident and Emergency department of the Royal Hospital for Sick Children in Edinburgh during seven days in February 2003. They shared a strikingly similar clinical picture with debilitating muscle pain in their calves. This paper discusses their clinical course and presents a literature review of the problem.

CASE 1
A 5 year old girl presented with a two day history of fever and headache, followed by a 24 hour history of painful calves. She had first experienced the pain when she got out of bed and had progressive difficulty walking. On examination she was apyrexial, coryzal, and had palpable cervical lymph nodes. She was walking with an antalgic gait bilaterally. Both calves were tender but no swelling, erythema, or wasting was noted. Her feet were unusually cold but capillary return was less than two seconds.

Her urine dipstick was normal. She had a mild leucopenia but platelets and erythrocyte sedimentation rate (ESR) were normal. Her creatinine phosphokinase (CPK) was impressively raised (see table 1).

She was discharged with dipsticks to check her urine and became asymptomatic within 24 hours. When she was seen in the review clinic two weeks later her CPK had returned to normal. Her convalescent serology showed no evidence of recent influenza A, influenza B, adenovirus, respiratory syncitial virus (RSV), cytomegalovirus (CMV), EBstein-Barr virus (EBV), or mycoplasma infections.

CASE 2
The next day an 8 year old boy attended with a two day history of headache, sore throat, anorexia, and pyrexia. Two days after this resolved he woke up with painful calves. On examination he was apyrexial, had enlarged tonsils, and palpable cervical lymph nodes. He had tender calves but no evidence of swelling or erythema.

His urine dipstick was normal. He had a mild leucopenia, borderline low platelets, but a normal ESR. His CPK was moderately elevated (see table 1).

He was discharged home with instructions to dipstick his urine and became asymptomatic 24 hours after discharge. When he attended review clinic two weeks later his CPK had returned to normal. Acute and convalescent serology showed no evidence of recent influenza A, influenza B, adenovirus, RSV, CMV, EBV, or mycoplasma infections.

CASE 3
The following day another 8 year old boy presented with a five day history of headache, coryza, and cough. He had developed calf pain the day before attendance. On examination he was apyrexial and had no palpable lymph nodes. He had tender calves and was walking with extended legs and a broad based gait. His neurological examination revealed no evidence of pathology. His feet were cold but capillary return was less than two seconds.

Again he had mild leucopenia, borderline low platelets, but a normal ESR. His CPK was very elevated (see table 1).

He was asymptomatic when seen in clinic two weeks later and his CPK had returned to normal. His acute and convalescent sera suggested a RSV infection in the recent past. However there was no evidence of recent influenza A, influenza B, adenovirus, CMV, EBV, or mycoplasma infections.

CASE 4
Four days later a 9 year old boy presented with what had been described as a “flu-like” illness with headache, vomiting, abdominal pain, and diarrhoea. On recovery from this he developed pain in both calves. The pain had been worse on awakening the day before attendance and had initially prevented him from walking.

On examination he was apyrexial. His calves were tender on palpation and on stretching. There was no swelling or erythema.

He had a leucopenia with low platelets but his ESR was normal. He had a moderately raised CPK (see table 1). His urine dipstick was negative for blood but positive for protein.

He was seen a week later in the review clinic and was asymptomatic. His blood results had returned to normal. His convalescent serum suggested a recent influenza B infection. There was no evidence of recent influenza A, RSV, CMV, EBV, or mycoplasma infections.

Abbreviations: BACM, benign acute childhood myositis; CMV, cytomegalovirus; CPK, creatinine phosphokinase; EBV, EBstein-Barr virus; ESR, erythrocyte sedimentation rate; RSV, respiratory syncitial virus.
DISCUSSION

Many patients complain of muscle pain in association with a viral illness. However, in 1957 Lundberg published the first report of “myalgia cruris epidemica” which seemed to be a newly identified syndrome of muscle pain, predominantly affecting the calves and occurring in school age children. The condition followed a prodrome of febrile illness, striking in the first few months of the year. The patients were typically boys, many of whom reported participating in strenuous activity before the onset of pain. All children recovered within a week. Lundberg felt that in view of the well described prodrome, the accumulation of cases within families and schools, in addition to leucopenia and increased sedimentation demonstrated in affected patients, the aetiological agent was likely to be a virus.

Lundberg’s report was followed by a cluster of papers in the 1970s and 1980s. The clinical picture was strikingly consistent and in addition it was noted that:

- The onset of pain tended to occur after a period of rest—that is, on awakening.2–4
- The vast majority of children tested had a raised CPK.2–10 In many cases this was massively elevated, however none of the children tested had evidence of rhabdomyolysis—that is, myoglobin in urine.
- Other less consistent laboratory findings are leucopenia,13–15 thrombocytopenia,1 and elevated serum glutamic oxaloacetic transaminase (SGOT).3–4 However, it seems that other viruses may also cause an indistinguishable syndrome. Indeed, more recently adenovirus,4 HSV,5 and EBV6 have been found in association with BACM.

SUGGESTIONS FOR MANAGEMENT BY EMERGENCY PHYSICIANS

A large number of conditions can cause muscle pain in children and it is important to distinguish BACM from other more severe illnesses.

Firstly the history is generally consistent: a viral prodrome followed by acute onset of severe muscle pain, usually confined to the legs. The resolution of symptoms is swift—many patients are markedly improved within 24 hours.

A full and thorough examination should be performed to include a detailed neurological examination. Neurological signs other than weakness as a result of muscle pain may herald more severe pathology.

The most consistent laboratory result is a raised CPK but it is important to rule out rhabdomyolysis by performing urinalysis for evidence of myoglobin. It is prudent if drawing blood to perform a full blood count, basic biochemistry, and send a serum sample to virology.

Features (see table 2) not associated with BACM should prompt further investigation and referral.

### Table 1 Blood results

<table>
<thead>
<tr>
<th>WCC (×10^9/L)</th>
<th>Platelets</th>
<th>CPK</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference range: 5–17</td>
<td>Reference range: 150–400</td>
<td>Reference range: 0–170</td>
</tr>
<tr>
<td>Case 1</td>
<td>3.6</td>
<td>250</td>
</tr>
<tr>
<td>Case 2</td>
<td>3.2</td>
<td>150</td>
</tr>
<tr>
<td>Case 3</td>
<td>3.5</td>
<td>147</td>
</tr>
<tr>
<td>Case 4</td>
<td>2.2</td>
<td>123</td>
</tr>
</tbody>
</table>

CPK, creatinine phosphokinase; RSV, respiratory syncitial virus; WCC, white cell count.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Disorder</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erythematous plaques on the face and eczema-like patches on flexor surfaces</td>
<td>Juvenile dermatomyositis</td>
</tr>
<tr>
<td>Severe systemic upset with myoglobinuria</td>
<td>Rhabdomyolysis</td>
</tr>
<tr>
<td>Recent travel to or residence in tropical area with fever, headache, eyes/pont/muscle pain, and a rash on extremities</td>
<td>Dengue fever</td>
</tr>
<tr>
<td>Insidious onset of painless weakness</td>
<td>Muscular dystrophy</td>
</tr>
<tr>
<td>Ascending symmetrical weakness often associated with pain and diminished reflexes</td>
<td>Guillain-Barré syndrome</td>
</tr>
</tbody>
</table>

Benign acute childhood myositis in an A&E setting 687

**Table 2 Features not associated with BACM**

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- Erythematous plaques on the face and eczema-like patches on flexor surfaces
- Severe systemic upset with myoglobinuria
- Recent travel to or residence in tropical area with fever, headache, eyes/pont/muscle pain, and a rash on extremities
- Insidious onset of painless weakness
- Ascending symmetrical weakness often associated with pain and diminished reflexes

- Juvenile dermatomyositis
- Rhabdomyolysis
- Dengue fever
- Muscular dystrophy
- Guillain-Barré syndrome
If the presentation is of classical BACM then the A&E clinician should feel comfortable discharging the patient. However we would recommend arranging to review the patient after a couple of weeks to ensure complete resolution of symptoms. At this stage it would be useful from an epidemiological point of view to draw blood for convalescent viral titres.

CONCLUSION

In publishing this case series we hope to raise awareness of an infrequently encountered condition among A&E clinicians. It is important to recognise BACM as a self-limiting condition which could however be mistaken for a more sinister disease and unnecessary tests instigated.

As clusters of cases occur, children are likely to self present to A&E because the symptoms are alarming and parents may feel inclined to bypass their GP. However the syndrome can be managed safely in an A&E setting without admission or referral, if there is capacity for review in an A&E clinic.

In highlighting this condition it may be that more thorough viral studies are performed in future cases, bringing us closer to understanding the infective aetiology of this syndrome.

REFERENCES

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