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Case series

Benign Acute Childhood Myositis associated with Influenza Virus Infection: A Case Series in Zawia Teaching Hospital

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Abstract
Benign acute myositis of childhood is a disorder of childhood, typically affecting boys. Symptoms include calf pain and difficulty walking after a prodromal viral upper respiratory illness. We report four cases of benign acute childhood myositis BACM in children diagnosed at Zawia Teaching Hospital had the typical clinical and laboratory characteristics of this clinical syndrome. Prompt diagnosis of this clinical disease essential to prevent unnecessary investigations and therapeutic interventions and to reassure the patient and parents of the excellent prognosis. The real time polymerase chain reaction test (RT-PCR) was used to detect influenza viruses from respiratory sample in all of them. Influenza B was determined in 3 patients (75%), and influenza A in 1 patient (25%). The Mean age was 7.25 years (4-11) and all of them were male and Urine analysis was not request for myoglobinuria. Influenza viruses, particularly H1N1 variants, can induce BACM and other types of muscular diseases. The Correct diagnosis by recognition of characteristic clinical, laboratory features of BACM and history of the preceding viral illness, as outlined in our case series provides cost effective and appropriate approach for diagnosis and prevent unnecessary treatment and diagnostic procedures. It is important to recognize BACM as self-limiting condition which could however be mistaken for a more aggressive disease.
Keywords: Benign, Acute, Child, Zawia Teaching Hospital.

Introduction

Boys are usually affected by the childhood disorder known as benign acute myositis of childhood. Walking difficulties and calf pain are symptoms of a prodromal viral upper respiratory disease. Influenza has an epidemiologic correlation. In 1957, Lundberg made the initial identification of BACM when he documented cases of a disease called myalgia cruris epidemic [1]. School-age boys are the primary patients of benign acute childhood myositis (BACM), relatively uncommon, self-limiting muscle illness. After a prodromal viral upper respiratory disease, it is clinically distinguished by the abrupt onset of calf discomfort and muscular tenderness, as well as a refusal to move and/or trouble walking [2].

Creatinine kinase (CK) levels in the serum are typically elevated. The early stage and clinical signs are largely the same for acute upper respiratory tract diseases, which are primarily caused by influenza viruses, especially influenza B. Medical professionals takes this problem seriously, and they make every effort to rule out infectious reasons or other dangerous potential causes promptly through appropriate clinical and laboratory testing. Parents are primarily concerned about the inability to walk, which is the main presenting symptom. There is a list of possible diagnoses for this presentation, including dangerous conditions including acute flaccid paralysis from poliomyelitis and Guillain Barre syndrome [3]. Within days of the illness starting, almost all cases will resolve on their own, with steady improvements in both laboratory results and walking ability [4].

There are extremely few reports regarding this individual from the Middle East, despite the fact that there are many recorded cases from other regions in the literature [5]. the purpose of this report was to provide the laboratory results, clinical aspects, and epidemiology of four cases that were identified with BACM following H1N1 infection in Zawia the western part of Libya. The medical records of children admitted to pediatric ward with symptoms suggestive of BACM at Zawia teaching hospital between May 2022and July 2022 with total of 12 were reviewed retrospectively. Here, we reported the clinical presentation and laboratory studies of 4 children with BACM associated with a proven influenza Virus A and B virus infection in pediatric department.

Cases presentation

Case 1

On June 25, 2022 a 6-year-old child who had previously been healthy was seen. He had a 4-day history of fever, cough, vomiting, diarrhea and an unusual walk. He had complained of calf pain when he awakened up at 3:00 AM in the morning on the day of admission and later that morning, he had trouble walking. Upon examination, he had a fever (38.9 °C), both calves were sore and passive ankle dorsiflexion caused pain. He was tiptoeing around. Both the lower and upper limbs showed normal tone, power, tendon reflexes and

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sensation. CPK was 1435 (normal range30-135 U/L), erythrocyte sedimentation rate (ESR) was negative, C-reactive protein (CRP) was negative and full blood count showed WBC (7.7*10). His serum creatinine (0.7) was normal. PCR was positive with Influence type B. Within 24 hours, he was able to walk better and had recovered completely on discharge day.

Case 2

A previously well 11-years old boy was seen in June-9- 2022 with a 3-day back history of fever, cough, vomiting, running nose. He had complained of weakness in both lower limbs and difficulty walking on the day of admission. Upon examination, he showed normal fever (37 °C), tenderness in both calves and pain when passively extending his ankle. Both the lower and upper limbs showed normal tone, power, tendon reflexes and sensibility. CPK was5288 (normal range 30-135 U/L), erythrocyte sedimentation rate (ESR) was negative and C-reactive protein (CRP) was negative and full blood count showed WBC (8.3*10). His serum creatinine (0.8) was normal PCR was positive with Influence type B. The boy was able to walk more easily and had completely recovered by the date of discharge. He received his discharge from the hospital in good general condition.

Case 3

On June 19- 2022, an eight-year-old boy child was admitted with a history of feeling unable to walk because of soreness in his calf muscle the day before. Two weeks prior, his mother revealed a history of upper respiratory tract infection. He was found to be apyrexial and unable to walk on assessment. Although there was no erythema, edema or wasting of both calves was visible, but it was painful. The results of the upper and lower limb neurological exams were normal. Initial laboratory investigations revealed an increased CPK level of 718 U/L, and leucopenia with mild neutropenia and lymphopenia. His erythrocyte sedimentation rate (ESR) was negative and C-reactive protein (CRP) was negative. His serum creatinine (0.36 mg/dL) within normal values. PCR was positive for influenzas B virus**.** The child was discharged 4 days after admission in good general condition, and his ability to walk had dramatically improved.

Case 4

A boy who was four years old was admitted on June 23, 2022, because of bilateral leg pain that began in the morning and got worse on the same day. He had a fever four days before. Upon examination, he had a congested throat and a fever. Upon physical examination of the lower limb, the patient's tendon reflexes, sensibility, and muscle power were all within normal limits. But he was unable to walk, and when the calf muscle was palpated, there was discomfort; there was no oedema, erythema or warmth detected. His creatinine phosphokinase (CPK) was raised (980 U/L) and he had a mild Leukocytosis (WBC; 13.55) but platelets, erythrocyte sedimentation rate (ESR), c-reactive protein and serum creatinine were normal. Three days later the patient was asymptomatic, and his PCR result positive for influenzas A virus. Urine analysis was not request for myoglobinuria. Improvement of symptoms and signs started within 24 to 48 hours for all cases, and recovered completely within 3 days at the latest.

Table 1. The demographic feature and clinical characteristics of the patients.

Case No	Age(years)	Gender	Symptoms of respiratory illness	Muscle Symptoms	Hospitalization days
1	6	Male	fever, cough, vomiting, diarrhea	abnormal gait	4
2	11	Male	fever, cough, vomiting, running nose	difficulty walking and weakness in both lower limb	3
3	8	Male	Fever, sore throat rhinorrhea,	bilateral calf pain and difficulty to walk	4
4	4	Male	fever, sore throat	bilateral calf pain and difficulty to walk	3

Table 2. Laboratory findings of four patients with benign acute myositis

Case No	WBC count x10⁹/L (3.5–9.5)	Platelets: (125–350)	CPK (30–135)	CRP mg/dl (up to 5)	Creatinine (0.6-1.2)	ESR	P C R
1	7.7	151	1435	0.11	0.7	-ve	Inf.B
2	8.3	224	5288	1.5	0.8	-ve	Inf.B
3	2.74	310	718	0.31	0.36	-ve	Inf.B
4	13.55	261	980	2.6	0.3	-ve	Inf. A

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Discussion

Benign acute childhood myositis (BACM) is a rare, self- limiting syndrome associated with various viral infections, Bilateral calve pain may lead to inability to walk. It is likely that sporadic cases of BACM occur regularly during influenza seasons, but overall, it is a rare entity and therefore many physicians are not familiar with this syndrome [6]. BACM is a frankly stereotyped disease, it has clear demographic, clinical and laboratorial characteristics as reported in the published literature [7&8]. Our statistical finding also revealed similar results such as the median age of 7.25(4-11yrs). On the other hand, this syndrome is more frequently reported in boys than girls as been described in most publications case reports with 2:1 distribution for boys and girls, respectively [9,10 & 11] which is consistent with our result findings. Were all the patients being male (100%), The reason for the more frequent occurrence in the male sex is unclear; genetic predispositions may play a role. The mean duration of prodromal symptoms in our study was three to four days which is the same finding to previous studies [1,7&12]. Several authors have noted onset of calf pain after a period of rest, often on waking in the morning, and with the maximum pain coinciding with return of the temperature to normal, [6&7] which is consistent with two patients in our study were waking up in morning with difficult in walking. after previous 4 days compliant of prodromal symptoms of upper respiratory tract infection. It might therefore help the physician to recognize this syndrome by keeping in mind that BACM symptoms appear after the main symptoms of influenza.

Our findings found that the Influenza B was the most frequently detected virus as well seen in 75% of cases when compared to similar reports in the literature influenza B is more commonly associated with BACM [5&13]. Pathophysiological mechanisms as to why influenza B virus is more strongly associated with BACM are not known, greater potency of direct muscle cell invasion of the influenza B virus has been suggested [8&11]. BACM should be included in the differential diagnosis of children with sudden difficulty walking. Most alternative diagnoses can be readily excluded, by elevated CPK combined with normal muscle power and preserved deep tendon reflexes help to differentiate BACM from Guillain-Barre syndrome. Arthritis where is frequently asymmetric in distribution and CPK values are normal. The most frightening complication of this clinical picture is rhabdomyolysis with myoglobinuria, which may result in electrolyte disturbances, acute renal failure and compartment syndrome, which is limited in our study because were did not requested urine analysis for myoglobinuria. Spontaneous and rapid recovery within a range of 1-6 days, which is another hallmark of BACM was observed in all of our patients well. Treatment is mainly supportive including analgesics, antipyretics and intravenous hydration for renal protection in hospitalized patients. Specific antiviral therapy was not applied since it is not recommended 2 days after onset of the illness [14]. However, whether administration of antiviral therapy for influenza from the beginning of infection can prevent occurrence of BACM is not precisely known yet. Prevention of this condition may be possible with vaccination. However, none of our patients were vaccinated against influenza.

Conclusion

Influenza viruses, particularly H1N1 variants, can induce BACM and other types of muscular diseases. Therefore, in an ongoing H1N1 influenza virus outbreak, children with walking issues and flu-like symptoms should be suspected of having BACM and separated from other causes by usual clinical criteria. In publishing this case series, we hope to raise awareness of an uncommonly encountered condition among physician. That is why, in the current H1N1 influenza virus pandemic, the BACM diagnosis must be suspected in those children with flu symptoms and difficulty to walk, taking this into account might help avoiding unnecessary studies and therapies.

Ethical approval

The study was approved by the ethics committee of faculty of Medicine, Zawia University and Zawia Teaching Hospital (2022).

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Conflict of interest. Nil

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المستخلص

التهاب العضلات الحاد الحميد في مرحلة الطفولة هو اضطرابات عضلية وعادة تؤثر على الأولاد أكثر من البنات. تشمل الأعراض ألمًا في ربلة الساق وصعوبة في المشي. بعد اعراض أمراض الجهاز التنفسي. العلوي الفيروسية. تمت دراسة أربع حالات من مجموعة اطفال دخلوا الي المستشفى وتم تشخيصهم وفقا للخصائص السريرية والمخبرية لهذه المتلازمة السريرية. إن التشخيص الفوري لهذا المرض السريري ضروري لمنع الفحوصات والتدخلات العلاجية غير الضرورية وطمأنة المريض والوالدين على التشخيص الممتاز تم استخدام اختبار تفاعل البوليميرات المتسلسل للكشف عن فيروسات الأنفلونزا من عينة الجهاز التنفسي. في كل حالة منهم, وتم تحديد فيروس الأنفلونزا B في 3 مرضى (75%)، وفيروس الأنفلونزا A في مريض واحد (25%). وكان متوسط العمر 7.25 سنة (4-11) وجميعهم من ذكور يمكن لفيروسات الإنفلونزا، وخاصةً فيروسات H1N1 أن تحفز الإصابة بالتهاب العضلات وأنواع أخرى من الأمراض العضلية. من المهم التعرف على تحفز الإصابة بالتهاب العضلات كمرض يختفي من تلقاء نفسه دون علاج ومع ذلك، يجب عدم الخلط بينه وبين مرض أكثر عدوانية.

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