

Myocarditis Related to Rhinovirus

Case Report

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Abstract

An 13 year old girl presented with chest pain, fainting and palpitations and was diagnosed with myocarditis by ECG and cardioechography. The child was treated in the ICU of the National Hospital of Pediatrics, and recovered well without complication.

Keywords: Myocarditis; Rhinovirus; Diagnosis.

Introduction

Myocarditis has been defined by the World Health Organization/ International Society and Federation of Cardiology as an inflammatory disease of the heart muscle diagnosed by established histological, immunologic, and immunohistological criteria [4]. It is a rare disease with the rate 0.5 patient per 10000 cases at the clinic [1]. It is caused primarily by numerous infectious agents, but it may also accompany autoimmune disease, hypersensitivity reactions, and toxins [2]. The core principles of treatment in myocarditis are optimal care of arrhythmia and of heart failure and, where supported by evidence, etiology-targeted therapy [3].

As myocarditis is an uncommon disease in pediatrics, we present this patient suffered from myocarditis and fully recovered without complication to share our experience in diagnosing and treating patient.

Case Presentation

A 13 years old girl presented with chest pain. 7 days before admission, the patient suffered from a mild fever, sneeze, and nasal discharge, tired and had a little cough. 3 days before admission, she had a poor appetite, felt faint and had chest pain. She was transferred to the provincial hospital, and then was diagnosed viral infection. She was treated with paracetamol, but she still felt chest pain. Therefore, she was transferred to the National Hospital of Pediatrics in the cardiology ICU with diagnosis of

cardiogenic shock and suspected myocarditis.

Pre-Medical History

Normal delivery. Normal development.

Examination

She was alert, a febrile, pallor, weak pulse and cold hands and feet. She had a little cough but no dyspnea. (Table 1)

Infectious status was unremarkable.

A cardiovascular examination: palpitation: 140 times per minute. Blood pressure: 80/50 mmHg, refill 2 second. T1, T2 were normal.

She had diminished bronchial rales in both lungs. SpO₂ = 100%

Investigations

Table 2.

Chest – X-ray

Figure 1 showed there was no change of heart's size in chest Xray at the first day of admission.

Figure 3 showed reduction of the left ventricular ejection fraction

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Table 1.

30 th May	1 st	2 nd	3 rd	4 th	5 th	6 th	7 th	8 th	9 th	10 th	11 th	12 th	13 th
Pulse (per minute)	150	147	148	152	139	140	147	144	140	143	132	128	140
Respiratory rate				24	23					18	20		23
Central venous pressure (cm H20)	8			7	7	7		8			9		
IBP (mmHg)	85/55	75/50	82/56	91/57	81/53	82/49	88/58	92/57	93/56	92/55	87/56	101/57	109/57
NIBP (mmHg)	61	58	65	67	60	58	66	66	64	64	66	67	70

Table 2.

Blood Cells Count	Results
White Blood Count (G/L)	9.9
Neutrophil (%)	70.3
Lymphocyte (%)	17.1
Monocyte (%)	8.2
Eosinophil (%)	0.4
Basophil	0.5
Red Blood Count (T/L)	6.01
Hemoglobin (g/l)	163
Hematocrite (%)	51.6
Platelet (G/L)	146

Figure 1. Chest- Xray.

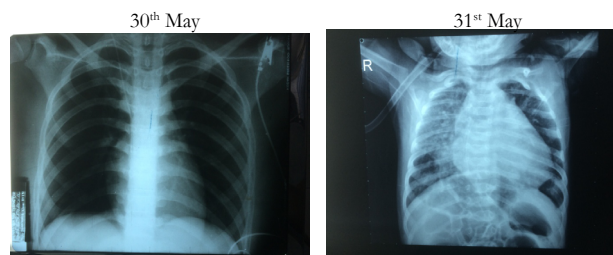
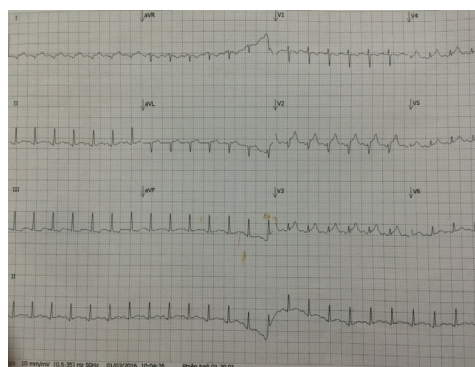


Figure 2. ECG.



ECG showed tachycardia sinus

(EF = 53%) and a little pericardial effusion at the first time of admission (30th May), then the ultrasound was normal after 4 days of treatment (2nd June).

Blood test: Serum protein: 50.7g/l, Albumin: 27.3 g/l, GOT: 47.3 U/L, GPT 13.4 U/L, ure: 5.72 mmol/l, Creatinin: 63 mcmol/l, CRP: 6.82 mg/l, procalcitonin: 0.17 ng/ml. PT: 94%, APTT: 35.6 s, Fib: 4.94, INR: 1.12.

Table 3.

Real time PCR Rhinovirus in the nasopharyngeal fluid: positive
 Real time PCR Adenovirus in the nasopharyngeal fluid: negative
 Real time PCR Enterovirus in rectal swab: negative
 Bacterial culture in the nasopharyngeal fluid: negative.

Final diagnosis: Myocarditis related to Rhinovirus

Figure 3. Echocardiography.

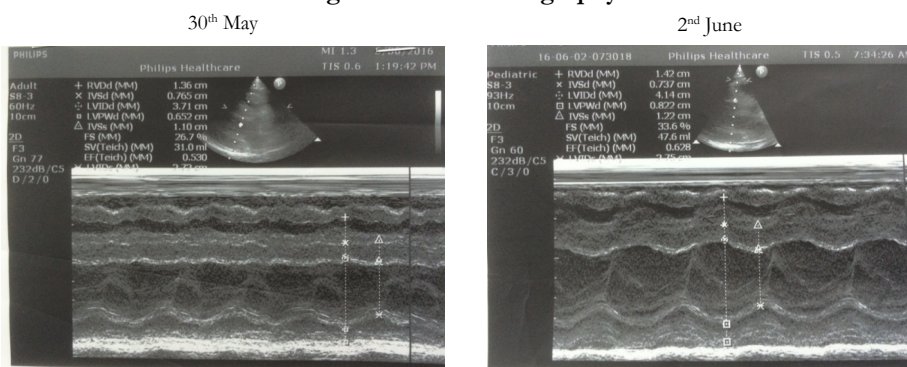


Table 3.

	30/5	31/5	1/6	6/6	10/6
CK-MB	36.87 U/L				
NT-ProBNP	708.9 pmol/l		1041	368.2	11.11
Troponin I	1.303 ng/ml		0.845	0.600	0.014
Ca ion	1.03 mmol/l	0,88.			
Mg	0.68 mmol/l	0.69			
Natri	127.6 mmol/l	129.1			
Kali	4.1 mmol/l	4			
Clo	99.5 mmol/l	98.3			
GOT	47.3 U/L	84.5			47.2
GPT	13.4 U/L	18.1			51.3

Treatment

The child was admitted to the ICU and an arterial catheter was inserted to monitor blood pressure.

The drug treatment:

1. Human Gamma globulin (High dose intravenous immunoglobulin) with dosage: 1 g/ kg of the body’s weight per day in two days (30th May and 31st May)
2. Dobutamin with dosage 7.5 mg/ kg of the body’s weight per day in the first three days (30th May, 31st May, 1st June)
3. Digoxin with dosage 0.01 mg/kg of the body’s weight in two days (31st May, 1st June).
4. Lopril, Lasix, Aldacton.

Result of treatment

Figure 4 showed the patient’s pulse reduce to normal, from the first day of treatment (average of pulse was 147 times per minute) to the 5th day of treatment (average of pulse was 95 times per minute).

Figure 5 showed the reduction of Nt- BNP from the first day of treatment (708.9 pmol/l) to the the 12th day of treatment (11.11 pmol/l). Troponin I also reduced from 1.303 ng/ml (first day) to 0.014 ng/ml (the 12th day).

Table 6.

Discussion

Myocarditis is a rare and life-threatening disease, however

its signs and symptoms can overlap with other illness, for examples respiratory and gastrointestinal complaints. The causes of myocarditis are diverse and include infectious, toxic, and autoimmune etiologies. Diagnosis is difficult because there is no sensitive and specific diagnostic test for myocarditis.

In this patient, the signs and symptoms were not clear at the first time, so that the patient was misdiagnosed with myocarditis at the provincial hospital and was in severe condition (cardiac shock) at the time of admission at the National hospital of Pediatrics. The diagnosis was finally confirmed by clinical assessment (chest pain, faint, palpitation) and investigations of ECG and cardiac ultrasound and the elevation of Troponin I [3]. Although the most common causes of viral etiology are Enterovirus (coxsackie virus group B) [1, 2]. We could not detect this due to the lack of the lab technique. The patient was treated and soon recovered well without complication, was followed up every 1 month at our hospital.

Conclusion

In pediatrics, myocarditis is a rare condition of which the most common causes of infectious etiologies are viruses. The spectrum of clinical symptoms varies from respiratory and cardiac complaints to gastrointestinal signs. Early diagnosis and treatment help patient recover well and reduce complications. However the child should be followed up long term with clinical assessment, ECG, echocardiography.

Acknowledgement

All authors have read and agreed to the final version of this

Figure 4. Patient pulse (times per minute in each hour of the day).

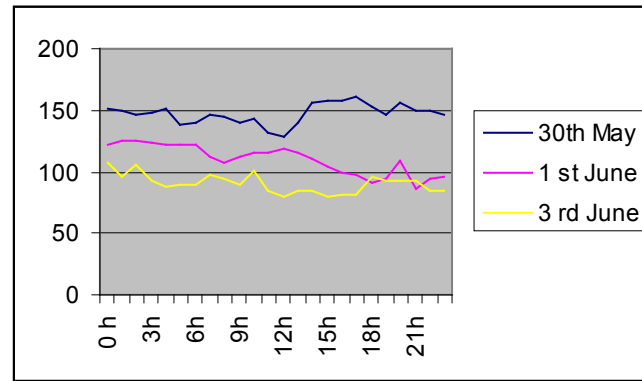


Figure 5. ProBNP (pmol/l) and Troponin I (ng/ml) following days.

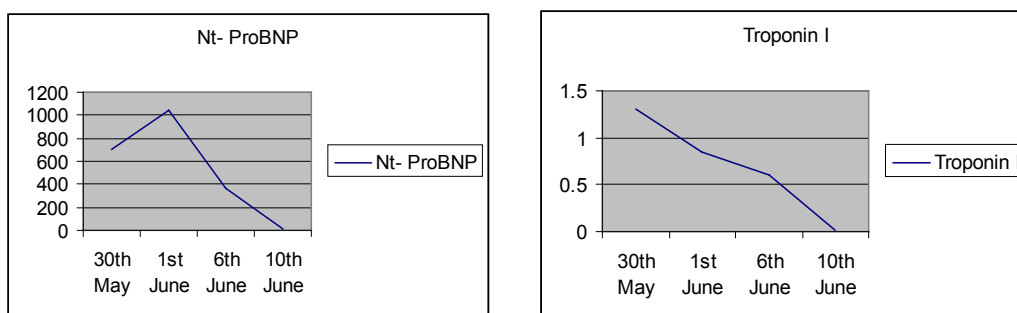
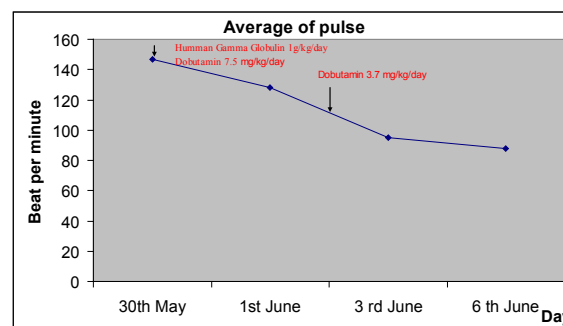


Figure 6. The Relationship between Pulse Rate and Treatment.



manuscript and have equally contributed to its content and to the management of the case.

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