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CASES STUDIES

Rescue and Nursing of Acute Severe Viral Myocarditis in Children

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ABSTRACT **Objective:** To explore clinical rescue and nursing measures for children with acute severe viral myocarditis. **Method:** Patients in the hospital were immediately given positive anti-heart failure, anti-shock therapy and correct treatment of arrhythmia. Large doses of gamma globulin, adrenal cortical hormone, pulse therapy, direct current cardioversion, vitamin C, oxygen inhalation, ECG and other treatments were given. **Results:** 58 cases were rescued successfully and the prognosis was good. However, there were 3 cases of patients with severe myocardial damage, ECG, ventricular fibrillation, and 1 invalid death. **Conclusion:** In the treatment of acute severe viral myocarditis of children, timely, accurate and safe implementation of various rescue measures is the key to improving the success rate.

KEYWORDS
Viral myocarditis
Rescue measures
Acute Severe

1. Introduction

Acute severe viral myocarditis, also known as the outbreak of myocarditis or fulminant myocarditis, refers to a variety of viral infections caused by serious, extensive myocardial cell damage. It has an abrupt onset, often behaving like cardiogenic shocks, acute heart failures and severe arrhythmias, which can lead to episodes of ASPEN syndrome if not timely rescued. Often in a few hours to 2–4 days, the prognosis is grave. Acute severe viral myocarditis causes serious, extensive damage of myocardial cells which is common in coxsackie virus, hepatitis B virus, hepatitis C virus (HCV) and would cause serious harm to adolescents [1]. Acute severe viral myocarditis has a rapid onset and the prognosis is adverse [2,3]. Therefore, timely diagnosis, treatment, and intensive care play an important role for improving the prognosis of the disease.

2. Materials and methods

2.1. General information

From September 2013 to October 2014, 60 patients with acute severe viral myocarditis were selected in our hospital, including 38 males and 22 females, aged from 6 months to 12 years old with an average age of 8.35 + 6.52 years old. All of them were treated with cardiac manifestations. Laboratory examination of 40 cases revealed that 20 patients had elevated serum creatine kinase, troponin elevation, and serum aspartate aminotransferase. From the 60 patients admitted with acute severe viral myocarditis, 18 cases exhibited complications with cardiac shock, 30 cases with cardiac dysfunction and 12 cases with severe arrhythmia.

2.2. Methods

All patients in the hospital were immediately given positive anti-heart failure and anti-shock treatments, arrhythmia correction, large doses of gamma globulin, adrenal cortical hormone pulse therapy, direct current cardioversion supplemented with vitamin C, oxygen inhalation, ECG and other treatments.

3. Results

58 cases were rescued successfully with good prognosis. There were 3 cases of patients with severe myocardial damage, ECG, ventricular fibrillation, and invalid death rescue.

4. Rescue and nursing

4.1. Psychological nursing

Due to the rapid onset of acute severe viral myocarditis, children and their parents lack mental preparation, causing panic. Explaining and informing about the disease to

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the patients and their families as well as comforting them would increase the effect of treatment, stabilize moods and increase active cooperation.

4.2. Disease observation

Clinical manifestations of myocarditis are diverse, often in the heart, beginning with respiratory and digestive tract symptoms as the first phenomenon. Since this occurs on young children, communication is difficult and this could easily lead to misdiagnosis. Early diagnosis is the key to success as well as the implementation of continuous ECG monitoring [4]. Routine bedside visits and communication with the patients as well as close observation of patients' heart rate, heart rhythm, consciousness, blood pressure and urine volume is important for emergency preparation such as defibrillation monitor, atropine, isoproterenol, lidocaine, propafenone, amiodarone and other antiarrhythmic drugs.

In addition to closely observing the heart rate, electrocardiogram, blood pressure, and blood oxygen saturation (SpO_2) changes, the performance of the heart is also very important. In this group, an 8year old child was admitted for having fever for three days, experienced syncopation 3 times within 2 h after being admitted. Another case involved a 6 year old child with abdominal pain, diarrhea and vomiting. 2 days after emergency admission, patient's complexion was cadaverous. Physical examinations found arrhythmia, low and blunt heart sounds, ECG showed third degree atrioventricular conduction block and the patient was given isoproterenol to maintain the heart rate. The patient was stable 3 days later.

4.3. Rest

Bed rest is the best way to reduce the heart load. It can not only guarantee enough time to return the blood but also it is an important treatment measure of viral myocarditis in the acute phase. Patients in this group were advised absolute bed rest for 2–3 months and to avoid vigorous activities until the symptoms disappear, vital signs stabilized, arrhythmia corrected, heart failure alleviated and myocardial enzymes gradually recovered. The nursing operation was carried out to avoid any adverse stimulation. If the patient was restless, doctors advised sedatives.

4.4. Heart failure nursing

According to the group of the Communist Party of China (CPC), there were 2 cases of failure. The main clinical treatment for fast heart rate (100–160 times/min), difficulty in breathing, complexion cyanosis, jugular engorgement, and oliguria are: (1) Patients were allowed to rest at semi-supine or sitting position; (2) 4–6 L/min, 30–50% oxygen humidification bottle is prescribed when necessary; (3) Drug therapies such as diuretics, vasoactive drugs, and sedative were prescribed according to the doctor's advice after analyzing accurate records of water and electrolyte balance within 24 h; (4) Inducing factors, such as infusion of too much, too fast, and so on should be avoided [5].

4.5. Medication nursing

The speed of infusion and drug reaction should be carefully monitored. Pharmacological compatibility and effects of the drugs and dosage needed to be conditioned accordingly and adjusted when necessary, using the infusion pump to control the infusion rate. Blood pressure should be closely observed along with the patient's heart function while controlling the amount and transfusion speed. For patients on diuretics, the change in urine volume and electrolytes should be monitored and recorded [6]. Doctor's advice on medication should be strictly followed especially on medication such as corticosteroids, antibiotics, booster drugs, diuretics, etc. Heart rates and rhythms needed to be measured before and after administering drugs and any reaction to the drugs such as drug poisoning needed to be observed. The use of calcium should be avoided and cardiac arrhythmias should be reported upon discontinuation of medication. The use of adrenal cortex hormone should be based on the doctor's advice and used only for a short term and is gradually reduced to prevent rebound.

4.6. Nursing of ECG defibrillation

ECG waveforms should be closely observed and indications of defibrillation, whether DC synchronous or asynchronous defibrillation, needed to be grasped. Defibrillation electrodes should be evenly coated with conductive paste with proper placement of the defibrillation electrodes, according to 2 J, 3 J, 4 J, 3 groups of a defibrillator. If unsuccessful, chest compressions should be done immediately to ensure that the heart would supply blood to the brain. During defibrillation contact with various conductive objects were avoided and accurate records of before and after defibrillation, ECG wave, heart rate, and skin damage were observed during the process. There were no skin injuries in this group of children. Regular inspection and correction of the defibrillator would ensure its safety and accuracy.

4.7. Psychological nursing

The disease has an acute onset and rapidly progresses. Children and their parents lack mental preparation, often causing panic. Patients and their families should be informed of the effects and treatment of the disease. With emotional stability, they can actively cooperate in the treatment, and notices were given should it reach a critical condition.

4.8. Disease observation

Clinical manifestations of the outbreak of myocarditis are diverse, often in the heart, with respiratory and digestive tract symptoms as the first phenomenon. Communication

is difficult on young children and this could easily lead to misdiagnosis. The main symptoms are chest tightness, chest pain, dizziness, limb weakness, paleness and other symptoms. Electrocardiogram would indicate pathological changes of ST–T. In addition to closely observing the changes in heart rate, ECG, blood pressure and blood oxygen saturation (SpO_2), the performance of the heart is also very important. In this group, an 8 year old child having fever for three days was admitted. Syncopation was observed 3 times within 2 h after admission into the hospital. Another case involved a 6 years old child with abdominal pain, diarrhea, and vomiting. 2 days after emergency admission, the patient's complexion became cadaverous and physical examinations found arrhythmia, low and blunt heart sounds, ECG showed third degree atrioventricular conduction block and the patient was given isoproterenol to maintain the heart rate. Patient was stabilized 3 days later.

4.9. Discharge guidance

To avoid catching a cold due to climate change, physical exercises to enhance physical fitness are needed to improve the body's resistance. Crowded areas needed to be avoided. Patients and their families were guided on ways to measure the heart rate, and heart rhythms. Sudden changes in its frequency, changes in blood pressure, chest tightness and heart palpitations must be immediately reported. Patients needed to be informed on the importance of regular examinations even after being discharged from the hospital. Patients would also need to continue to rest and continue their treatment such as taking their medicine according to the doctor's advice, avoid overworking, and only light manual work is allowed a month after being discharged. Patients' diet should be adjusted, avoiding alcohol, tobacco, coffee and spicy foods while consuming more fruits and vegetables. [7].

5. Conclusion

Acute severe viral myocarditis, acute left heart failure or cardiac shock causes severe and rapid deterioration and if not treated appropriately can cause death in a few hours. Therefore, dynamic observation and monitoring of patients with acute severe viral myocarditis is the responsibility of every nurse. Timely, accurate and safe implementation of various rescue measures is the key to improving the success rate of rescue. Acute severe viral myocarditis is a life-threatening disease and the age of onset is more common in preschool or school-aged children, with a clear history of viral infection, often at the same time or several days after viral infection. Because of its atypical symptoms, rapid changes in the disease and high mortality, medical staff should closely observe the changes in patient's condition, monitoring vital signs and ensuring a good job in the rescue work in order to save the lives of children.

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