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Review Article

A Case Report and Literature Analysis of Haemorrhagic Fever Characterized by Eyelid Swelling

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Abstract

Objective the morbidity and mortality of haemorrhagic fever in children is low [1], with atypical clinical manifestations, high out-of-phase rate and easy misdiagnosis at the early stage of disease. There are few reports on HFRS in children in China. This paper describes a case of Haemorrhagic Fever with Renal Syndrome (HFRS) in children with edema of the first eyelid as the primary symptom to enhance clinicians' understanding of this disease and reduce misdiagnosis.

Introduction

Haemorrhagic fever epidemic haemorrhagic fever and haemorrhagic fever of renal syndrome, is an important infectious diseases endangering human health, is made up of epidemic haemorrhagic fever virus (hantavirus) [2], rats and mice as the main source of natural foci of the disease, poison type in our country, its pathogenic disease for han beach and Seoul [2], the main source of infection for the black ky mice, rats and other rodents in brown [3]. Virus can be discharged through the blood, saliva, urine and stool of host animals, and direct transmission from mice to humans is an important way of human infection. The main clinical manifestations were fever, haemorrhage, hyperaemia, hypotension shock and renal damage. It is generally believed that people are generally susceptible, with a low rate of hidden infection and a high incidence in young adults. Adult patients with HFRS have typical three main symptoms, namely fever, bleeding and renal damage. Meanwhile, the "three pains" (headache, back pain and orbital pain) and "three swelling" (combined with membrane edema, eyelid and facial edema) show prominent manifestations [4]. In contrast, the morbidity and fatality rate of children are relatively low, and the clinical manifestations are not typical [5], so it is easy to be misdiagnosed at the early stage of the disease. This paper summarized the characteristics of double eyelid edema, accompanied by fever as the first clinical manifestations, laboratory and imaging examination results, complications, etc., for the reference of clinicians.

Case introduction

The child, female, 9 years old, was admitted to the hospital with "fever for 4 days and edema of double eyelids for 1 day". No contact history of epidemic area, acute onset, obvious symptoms. Four days ago, the child developed fever without obvious causes, the highest body temperature was about 40.2 °C, the limbs were cold, accompanied by headache and dizziness, the skin and mucous membrane of the whole body had no rash and bleeding spots, no chills, convulsions, no cough and asthma, no nasal congestion or runny nose, no vomiting or diarrhoea, and she was admitted to a hospital. The blood routine showed: WBC 3.53x10⁹ /L N 0.736 L 0.159 M 0.099 PLT 140X10⁹/L RBC 4.95x10¹² /L HGB 139g/L, CRP is normal; Novel coronavirus nucleic acid test: negative; Influenza A B virus antigen: negative, the patient was given intravenous drops of "cefazoxime sodium, vitamin C", "dexamethasone" into the pot and oral treatment of "Lanqin oral liquid, oseltamivir phosphate granules", etc., the patient still had repeated fever and poor spirit. Double eyelid edema and no lower extremity edema appeared 1 day ago. Then he went to the fever clinic of a hospital, and urine routine test showed protein 3+; Occult blood plus or minus; Plus or minus ketone body; Epithelial 156ul RBC 66.7ul Tubular Type 8.57ul Pathological Tubular Type 5.22ul. During the course of the disease, the child had headache, dizziness, fatigue, no conjunctival congestion, no vomiting, diarrhoea, no rash and bleeding spots, poor mental health, food, night rest, and normal urine and faces. Physical examination after admission: Body temperature: 38.1 °C Pulse: 99 times/min Respiration: 23 times/min Weight: 44.5 kg Blood pressure: 96/65 MMLLG. Mind clear, spirit is poor, acute hot ill, the whole body skin mucous membrane did not see a rash, bleeder and ecchymosis, the neck has not hit swollen lymph nodes, double eyelid edema, conjunctival congestion, oral, pharyngeal hyperaemia, bilateral amygdala II ° enlargement, did not see purulent secretion, double lung breath sounds, not smell and dry wet song, toughening, liver and spleen rib is not obvious under the touch, shifting dullness suspicious positive, bowel sounds, no nervous system abnormalities.

Auxiliary Inspection

(2020-11-27) Blood routine: WBC 3.53X10⁹ /L N 0.736 L 0.159 M 0.099 PLT 140x10⁹/L RBC 4.95X10¹²/L HGB 139g/L

CRP: negative; Novel coronavirus nucleic acid test: negative; Influenza A B virus antigen: negative; The routine urine examination on the first day of hospitalization showed protein 3+ occult blood ± ketone bodies ± epithelial cells 156ul red blood cells 66.7% ul tube type 8.57ul pathological tube type 5.22ul. That afternoon epidemic haemorrhagic fever IgM, IgG antibodies: all positive; Blood routine: WBC 17.01X10⁹ /L N 0.59 L 0.23 M 0.1PLT 28X10⁹/L RBC 5.62X10¹² /L HGB 159g/L. hs-CRP: >5 5mg/L CRP: negative; ASO: 229IU/ml; C3:0.53 g/L; Total blood lipid: TG 2.76mmol /L HDL-C: 0.44mmol /L ApoA I: 0.7g /L ApoB: 0.55g /L ApoE: 60.92mg /L; PCT: 2.765 ng/ml. No obvious abnormality was found in respiratory tract five test, EB virus DNA, residual humoral immune index, and Mycoplasma pneumonia antibody. Transferred to infectious disease hospital for treatment. (2020-12-02) ALB: > 50ug/ml; Nine pathogens of respiratory tract infection, EB virus antibody negative. Kidney-free function: B 2-mg (blood) 4.83ug /ml B2-mg (urine) 1406ug /ml A 1-mg 30ug/ml. The child had fever on admission. According to the requirements of Novel Coronavirus prevention and control guide, the test of COVID-19 nucleic acid and antibody was negative, and symptomatic treatment such as anti-infection and supportive treatment was given. Subsequent laboratory examination results showed epidemic haemorrhagic fever IgM, IgG antibodies: both positive; In accordance with the State Measures for the Control of Infectious Diseases, treatment shall continue in the transfer hospital. After that, the family members of the child were followed up by telephone, and the changes in renal function and electrolyte were dynamically monitored



after being in the infectious disease hospital, symptomatic treatment was given to actively prevent renal function damage, and then the patient was discharged from hospital after improvement.

Literature Analysis

Etiology of hantavirus biological characteristics

the latest, according to the international classification of virus pathogens can be divided into yellow virus family of viral haemorrhagic fever, filamentous virus, hantavirus and sand division, such as haemorrhagic fever of renal syndrome caused by hantavirus belongs to cloth virus, hantavirus division, the virus is single-stranded RNA virus [6], the main features of small changes in a short period of time, long time change is big, viruses are circular or ovoid, with double membrane, the plasma for granular. Linear structure. In addition, the virus has poor heat resistance and acid resistance, and is highly sensitive to lipid solvents. It can also be deactivated by general disinfectant, alcohol, ether, chloroform, acetone and other reagents. It can also be deactivated in 56C environment for 30 min, 100C environment for 1min or pH 3~5. With the deepening of the research on the nature of the disease and virus, new Hantaviruses have been discovered. Up to now, more than 40 different genotypes of Hantaviruses have been discovered according to the different gene structures of viral antigens. Its representative types include Hantan virus (HINV), Seoul virus (SEOV), Puumala virus (PUU) and Dobrava virus (DOBV). Hantavirus and Seoul virus can also cause hemorrhagic fever with renal syndrome, most commonly found in Asia, and China is the most severely affected country [7, 8].

Host animals and source of infection

According to the 10th International Conference on Hantavirus, the Hantavirus family includes a variety of viruses isolated from rodents, moles and bats, and the interactions and ecological relationships between the viruses and their hosts are complex. For Hantavirus, different genotypes of Hantavirus all have specific hosts, and the population density and spatial distribution of host animals are the key factors determining the prevalence of Hantavirus. Up to now, more than 170 vertebrates have been found to be infected with Hantavirus, among which the main host animals and infectious sources are Apodemus agrarius and Rattus norvegicus. The Hantavirus genus viruses found in China are Hantavirus and Seoul virus, and their original hosts are different. The original host of Hantavirus is Apodemus agrarius, while the original host of Seoul virus is Rattus norvegicus. Some scholars have found that Apodemus edelus, experimental rats, wild rodent lozenges, trichrome, black line hamsters and mainly domestic Mus muscles can all become the source of infection.

Transmission Route

HFRS is mainly transmitted to humans through rats and is transmitted through the blood, saliva and feces of infected rats. Direct or indirect contact with infectious sources can also cause infection. "The transmission rate depends on the activity site and range of people and their contact with infectious sources. With the depth of research, route of transmission of HFRS also ideal progress, mainly include:

Wounds

The saliva of infected mice, can be found in the blood and urine pathogens and long-time still contagious in external environment, such as being bitten by mice, or patients with skin damage, direct contact with infected rat droppings and secretions can infection occurs;

Respiratory tract transmission

The faces of infected rats are polluted and can produce aerosol particles, which enter the human body through the respiratory tract and cause infection

Digestive tract transmission

The saliva and faces of infected rats are infected with sexually transmitted diseases; contaminated water and food, human consumption after the pathogen can be transmitted through the digestive tract;

Arbor-borne transmission

The main arbor-borne vectors of HFRS among mice were gamasid mites and scrub mites, which could cause infection after biting human body.

Mother-to-child transmission

Infected mice can transmit the virus to fatal mice. After pregnant women with HFRS fail to receive treatment, the pathogen can be transmitted to the foetus through the placenta, resulting in fatal infection.

Susceptible population

People of different ages, genders and occupations are generally susceptible to Hantavirus, but the infection rate is different. The incidence of male is higher than that of female. Data show that the incidence of HFRS tends to shift towards middle-aged and elderly people, and the proportion of the onset age of young and middle-aged people has decreased [9], while the infection rate of children is relatively low. Distribution of HFRS epidemic areas: China is the country with the most severe epidemic of HFRS. Since it was first discovered in Heilongjiang Province, the epidemic area of HFRS has gradually expanded. So far, more than 30 provinces in China have reported outbreak, mainly in Shandong, heilongjiang, shaanxi, zhejiang, jiangsu, jiangxi and human province and other regions, research data show that the HFRS in shaanxi province and Shandong province and other regions in the bimodal characteristics of autumn and winter season disease, and has obvious regional and spatial clustering, jilin province, Zhejiang province and jiangsu province and other regions reported cases present similar distribution characteristics. The morbidity and fatality rate of children are low [9], and the clinical manifestations are not typical, and it is easy to be misdiagnosed. Most of them do not recognize the symptoms of "three redness, three pain", etc., but may have headache, vomiting, eyelid edema and other primary symptoms [10], which may progress to multiple organ damage, such as diabetes, etc. [11]. Most have a good prognosis.

Treatment Methods

For the treatment of children with renal comprehensive haemorrhagic fever, comprehensive preventive treatment should be carried out based on liquid therapy according to the pathophysiological changes of each stage. Mainly to prevent shock, avoid kidney injury and prevent bleeding, and in different pathological stages to give symptomatic treatment.

1. Pay attention to antipyretic period, and use anti-exudation, anti-bleeding, antiviral drugs, such as ribavirin, etc. In the hypotension shock stage, balance salt was the main treatment, and the ratio of crystal to gel was 3:1. Albumin was used as the case may be, and the blood volume was expanded rapidly in sufficient amount. At the same time, 5% NaHCO₃ (dose < 600 mL/24 h) was applied to correct the acidosis according to the blood gas.
2. During oliguria, the focus is on maintaining the balance of internal environment such as water; electrolytes, acid-base and heat, and haemodialysis should be applied when there are relevant indications [7]. Furosemide was the first choice to promote diuresis after blood pressure stabilized for 12-24 h. Water and electrolyte balance should be maintained to prevent secondary respiratory tract and urinary tract infection during diuria.
3. During the convalescence, we should pay attention to supplement nutrition and gradually resume work; Regular review of renal function, blood pressure and pituitary function; Active treatment of residual diseases, such as hypertension, anemia, chronic renal insufficiency, etc. There are few cases of haemorrhagic fever with eyelid edema as the primary symptom in relevant literature in China.

Discussion

The child was a school-age child with no previous exposure to the source of infection. The typical manifestations of haemorrhagic fever were infectious viremia and systemic capillary damage. The onset is urgent, there is fever (38°C ~ 40°C), three pain (headache, low back pain, orbital pain) and nausea, vomiting, chest tightness, abdominal pain, diarrhea, systemic joint pain and other symptoms, skin mucosa three red (face, neck and upper chest red), eye conjunctival congestion, heavy like drunk appearance. There were bleeding spots or ecchymosis of different sizes in oral mucosa, chest back and armpit, or bleeding spots like cord and scratch. Failure to timely treatment may result in renal function damage and pathological changes of multiple organs in the body, and even life-threatening [12]. The child did not have typical "three red" and "three pain" manifestations, but mainly with eyelid edema and fever as the first symptoms, which should be alerted. Since the beginning of 2020, the reported cases of hemorrhagic fever in Northwest China have increased [13] compared with previous years, and most of them are mostly adult males, less teenagers and school-age children, and most of them have typical symptoms of "three red" or "three pain" [14]. In this case, the first presentation of the



child was fever and bilateral eyelid edema, which was different from the previous reported cases of haemorrhagic fever and worthy of attention. This case suggests that in the case of childhood haemorrhagic fever, the clinical symptoms are not typical, simple fever and eyelid edema can be the first manifestation of haemorrhagic fever. Because fever and eyelid edema are the primary symptoms, they are hidden to a certain extent, so that the first doctor should first consider the diseases such as acute glomerulonephritis caused by recent streptococcal infection, or diseases such as nephrotic syndrome, which can easily lead to edema, so as to ignore them and cause harm to patients and medical staff. This case is a single case report. Whether fever and eyelid edema are another primary manifestation of haemorrhagic fever needs to be confirmed by more cases. Although the number of cases of childhood haemorrhagic fever is rare, the management of such children should be strengthened to reduce the possibility of becoming a source of infection in the community. As the understanding of haemorrhagic fever continues to deepen, more cases of infection in children may be encountered, and this case report may be of reference value for such cases [15].

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