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A case of chickenpox with complication of post-infectious thrombocytopenic purpura

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Idiopathic thrombocytopenic purpura is a rare but serious complication of chickenpox. The purpose of this report is to describe a case of varicella-related complications of post-infectious idiopathic thrombocytopenic purpura, with a brief review of the literature related to varicella-related haemorrhages, and to determine the specific features of treatment of such children. A 5-year-old unvaccinated boy was admitted to the hospital for infectious diseases on the 7th day of illness. It was found that on the 5th day of the disease onset, crusts and haemorrhagic rashes measuring 10x10 mm appeared on the skin of the child. Then, on the 6th day of the disease, multiple blood exudates of various shapes and sizes (from 1 mm to 30 mm in diameter) and two episodes of nose bleeding appeared. Blood test showed a platelet count of 9.0x10^9/L. Intravenous immunoglobulin was administered to the child for treatment. The child was discharged from the hospital in a satisfactory condition on the 6th day of treatment. There was no recurrence of the disease within 1 year after the illness. Thus, taking into account the positive effect of the use of intravenous immunoglobulin in post-infectious idiopathic thrombocytopenic purpura, it can be recommended to be used in this condition. However, additional studies are needed to clarify the mechanisms of development of this complication. It is possible to prevent the disease and its serious consequences by vaccinating children against chickenpox.

Key words: CHICKENPOX; PURPURA, THROMBOCYTOPENIC, IDIOPATHIC; CHILD, PRESCHOOL

INTRODUCTION

Chickenpox is a self-limiting benign disease; occasionally, it may cause complications (1-3). The most common infectious complication of varicella is secondary bacterial infection of the skin, most often by *staphylococcus* or *streptococcus* species. The most common extracutaneous site of involvement is the central nervous system (CNS), i.e. acute cerebellar ataxia, aseptic meningitis and encephalitis. Transverse myelitis, Guillain-Barré syndrome and Reye's syndrome can also occur. Varicella pneumonia is the most serious complication following varicella infection, developing more commonly in adults (up to 20% of cases) than in children. Other rare complications include myocarditis, corneal involvement, arthritis, bleeding diathesis, acute glomerulonephritis and hepatitis (4). The incidence of idiopathic thrombocytopenic purpura (ITP) among children with varicella is estimated to 1:25,000, and ITP associated with varicella accounts for 1.9% of paediatric ITP cases (5). The cause of complications has been postulated as either direct viral invasion or through an immune-mediated allergic mechanism. Most pathological studies have shown that it is more likely to be allergy-mediated injury (1).

We present a previously healthy child suffering from chickenpox with thrombocytopenic purpura that was managed successfully with intravenous immunoglobulin.

CASE REPORT

A 5-year-old child was admitted to the infectious diseases hospital on the 7th day after the onset of chickenpox. The diagnosis was chickenpox, recovery period. Complications: idiopathic thrombocytopenic purpura, nasal bleeding, 1st degree anaemia.

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According to the history, the child was not vaccinated against chickenpox. The course of the disease was of moderate severity (temperature 38.5 °C, rash spread on the skin and mucous membranes). The child was treated on an outpatient basis (brilliant green locally). On the 5th day of the disease, 10x10 mm single haemorrhages appeared on the skin of the body and limbs; on the 6th day, there were multiple blood effusions of various shapes and sizes (from 1 mm to 30 mm in diameter) and nasal bleeding was noted twice. Clinical blood analysis showed platelet count $9.0x10^9$/L. During hospitalization the clinical blood analysis showed the following results: haemoglobin 9.7 g/dL, red blood cell (RBC) count $3.3x10^{12}$/L, white blood cell (WBC) count $10.3x10^9$/L, eosinophils 2%, stab neutrophils 2%, segmented neutrophils 71%, lymphocytes 24%, monocytes 1%, erythrocyte sedimentation rate (ESR) 30 mm/h, platelet count $6x10^9$/L. There were no changes in biochemical blood analysis and duration of bleeding. Liver function and renal function tests were normal. The child's coagulation profile: bleeding time five minutes, clotting time six minutes, thrombin time 16 seconds, serum fibrinogen level 210 mg/dL.

Due to the repeated nasal bleeding, the child was treated with anterior and posterior nasal packing in the hospital. The following treatment was prescribed: intravenous immunoglobulin 8 mL/kg *per* day for 4 days.

As a result of treatment, nasal bleeding stopped on the 2nd day, there was no new rash on the skin, and platelets began to increase gradually and reached the level of $198x10^9$/L on clinical blood analysis on the 4th day of treatment.

The child was discharged from the hospital in satisfactory condition and under supervision of haematologist and family physician on the 6th day. At 1-year follow up, he was fine, without any complaints and with normal clinical blood tests.

A written informed consent was obtained from the patient's parents.

DISCUSSION

Our case demonstrates that thrombocytopenia is one of the rare but well-known complications of primary varicella zoster infection and its early diagnosis is essential for appropriate management of the patient. Although various mechanisms have been implicated in its pathogenesis, including decreased bone marrow production of platelets, disseminated intravascular coagulation and virally induced platelet aggregation followed by phagocytosis or lysis, the main mechanism implicated is immune-mediated platelet destruction (6). Today, it is proved that the mechanism of post-varicella purpura fulminant is thought to be due to development of antiprotein S antibodies. These antibodies lead to acquired transient severe protein S deficiency, which results in disseminated intravascular coagulation and microvascular thrombosis (7). Treatment is symptomatic, including fresh frozen plasma to treat protein depletion, antithrombin III and heparinisation against thrombus formation, and anti-inflammatory drugs (steroids) (8). However, new therapies such as prostaglandin E intravenously and prostacyclin are being introduced (3). In addition, successful use of both corticosteroids and intravenous immunoglobulin has been reported, the former past the incubation period of chickenpox because corticosteroids at doses ≥0.5 mg/kg/day during the incubation period of varicella can lead to development of visceral varicella (6). Other studies also found early platelet count recovery within three months of intravenous immunoglobulin treatment, predicting a short duration of disease and favourable outcome in children with newly diagnosed ITP (9).

Although thrombocytopenia can be a finding of severe varicella, isolated thrombocytopenia in otherwise healthy children who are recovering from chickenpox has an excellent prognosis (6). This complication could be avoided by to anti-varicella zoster virus vaccination (10, 11).

CONCLUSION

The resulting positive effect of intravenous immunoglobulin for post-infectious ITP allows us to recommend its use in this state. However, further research is needed to clarify the mechanisms of development of this complication. In conclusion, taking into account the availability of various treatment approaches, research on this type of chickenpox will be very interesting and useful for the practitioner.

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SAŽETAK

Slučaj vodenih kozica s komplikacijom postinfektivne trombocitopenične purpure

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Idiopatska trombocitopenična purpura je rijetka, ali ozbiljna komplikacija vodenih kozica. Namjera ovoga prikaza je opisati slučaj s vodenim kozicama povezane komplikacije postinfektivne idiopatske trombocitopenične purpure, uz kratak pregled literature o krvarenjima povezanim s vodenim kozicama te utvrditi specifične značajke liječenja takve djece. Petogodišnji necijepljeni dječak primljen je u bolnicu za zarazne bolesti 7. dana bolesti. Utvrđeno je da su se kraste i hemoragični osip veličine 10x10 mm pojavili na djetetovoj koži 5. dana od nastupa bolesti. Potom se 6. dana bolesti pojavilo više krvnih eksudata raznih oblika i veličina (promjera od 1 mm do 30 mm) i krvarenje iz nosa u dva navrata. Krvne pretrage pokazale su broj trombocita od 9,0x10^9/L. Dijete je liječeno intravenskim imunoglobulinom. Dijete je otpušteno iz bolnice 6. dana liječenja u zadovoljavajućem stanju. Nije bilo recidiva bolesti u godinu dana od nastupa bolesti s komplikacijama. Stoga, uzimajući u obzir pozitivan učinak primjene intravenskog imunoglobulina u liječenju postinfektivne idiopatske trombocitopenične purpure, njegova se primjena može preporučiti za ovo stanje. Međutim, daljnja istraživanja su potrebna kako bi se razjasnili mehanizmi razvoja ove komplikacije. Vodene kozice i njihove ozbiljne posljedice moguće je spriječiti cijepljenjem djece protiv ove bolesti.

Ključne riječi: VODENE KOZICE; PURPURA, TROMBOCITOPENIČNA, IDIOPATSKA; DIJETE, PREDŠKOLSKO